

Acculturation and Development of Korean American Parents and
Their Perspectives on Mathematics Education

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ABSTRACT

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The purpose of this study was to investigate how parental beliefs, practices, and values of Korean immigrant parents regarding mathematics education in the United States are adjusted from the perspective of ecology of human development. This research further explored how participants' cultural identities are affected by acculturation process. In addition, the researcher examined the transformations of parents' perspectives on mathematics learning and achievement as they integrate into the dominant culture. The study used mixed methods to obtain information about the research participants' experience as immigrant parents and interrelationships with their second-generation children regarding mathematics learning and achievement. A sample of Korean American parents ($n = 44$), whose children were currently enrolled in a mathematics course at the time or had taken at least one mathematics course within the past 3 to 5 years in middle or high school, participated in a quantitative survey; a subsample of immigrant parents ($n = 10$) participated in semi-structured interviews. The study utilized the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA) and the Attitudes Toward Mathematics Inventory (ATMI). The results of the study indicated that even though Korean American parents shared the same nonnormative transition, they developed diverse intrinsic values and acculturation styles. Further, the parents' perspectives on their children's mathematical learning and achievement were influenced by traditional culture, dominant culture, and the interaction of both. The study also revealed that Korean immigrant parents used other Asian American students' mathematical performance and learning as a frame of reference for their own children's mathematical

performance and learning; in addition, parents' participation in children's mathematics at home differed by acculturation levels. The main reason for the parents' active support of and engagement in mathematics was that mathematics was the only subject which these immigrant parents adequately understood, and their aspiration for higher mathematics education was due to both immigrant optimism and pessimism. After moving to a different country, Korean parents' abilities to perceive, conceptualize, and interact develop at different levels in new complex environments, where values, customs, and socioeconomic status contrast with those they had developed previously. These changes in intrafamilial processes and extrafamilial situations affected the development of the Korean immigrant parents' cultural identity and reciprocal interactions with their second-generation children.

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DEDICATION

To my mother, Donchul Jung,
for always supporting and
encouraging me
to never stop learning.

Chapter I

INTRODUCTION

Need for the Study

Parental involvement is one of the most influential factors in promoting children's academic growth. Research has shown that students benefit from increasing academic achievement when parents actively manage and engage in their schooling (Baker & Stevenson, 1986). Also, there exists a strong correlation between parents' educational expectation and children's academic accomplishment (Trusty, 2000; Yan & Lin, 2005), and these expectations influence children's decision making on educational choices such as colleges to attend or academic courses to take. Peressini (1998) wrote that involvement in decision making is the "most empowering and productive type of parental involvement" (p. 324), yet the most "difficult and challenging type of involvement to organize and implement" (p. 324). Especially in mathematics education, more active and specific opportunities of parental involvement are encouraged from both parents and mathematics teachers. The types of involvement include communication between mathematics educators and families using newspapers, developing networks, and conducting "back-to-school nights" for parents; volunteer opportunities in the mathematics classroom; assigning activities in which both children and parents need to be involved in mathematics teachers' guidance for when and how parents can assist; community collaboration as in "coordinating the work and resources of community businesses, agencies, colleges or universities, and other groups to enhance student learning, family practices, and

school programs” (p. 324); and finally, including parents in decision-making processes on mathematics curricula, textbooks, assessments, or reform-based programs (Peressini, 1998).

Mencius, a Chinese philosopher, and his mother are renowned in Korea with the idiom 孟母三遷之教. The idiom translates and refers to how Mencius’ mother moved three times to expose her son to a better environment: first, they moved to the neighborhood near a cemetery, where he imitated the mourners at the funerals; second, they lived near a market, where he imitated merchants; finally, they moved to a house near a school, where he started his studies. This shows not only the impact that a parent can have on a child’s educational development, but also the significance of a child’s exposure to social environment. More recently, Chetty, Hendren, and Katz (2015) reported that the enhancement of a neighborhood environment in early childhood can positively influence children’s long-term outcomes, such as higher income and attainment of postsecondary education. In the Moving to Opportunity (MTO) experiment, where high-poverty families were randomly selected to move to lower-poverty housing projects, Chetty et al. (2015) found that MTO was not as effective on parents’ economic outcomes as it was on children’s long-term outcomes. Whether such environmental changes impact immigrant adults’ developmental outcomes and impact their second-generation children’s mathematics education remain to be explored.

In 2011, Amy Chua, a Chinese American mother, published *Battle Hymn of the Tiger Mother*, which brought irreconcilable opinions on whether the author’s parenting method was justifiable. Asian American mothers have been viewed as “non-democratic, brazen, and less affectionate” (Nguyen, Chang, & Loh, 2014, p. 48) with parenting practices that “ridicule, [with] close monitoring, and behavioral restrictions” (p. 48). Chua’s memoir was solely about her experience as both a parent and an immigrant child herself, so it cannot be representative of the

whole Chinese American population and surely not of all Asian immigrants in the United States, although many people started questioning why Asian American parents place such enormous value on their children's academic achievement. The great significance that Asian immigrant parents have placed on education and educational success has led them to carry high expectations from their children; hence, more recurrent parental involvement in academic achievement is to be found, particularly in mathematics (Kim, 2002; Yan & Lin, 2005). Further, these parents consider mathematical performance is developed through tremendous effort, not by natural ability, and the effort in practicing is promoted more often in mathematical learning (Treisman, 1992; Walker, 2003). To understand how Asian immigrants strive for social mobility using mathematics education as a medium, one needs to examine their cultural meanings of education and individual development in the host country that, in turn, impacts second-generation children's learning processes. However, during the process of immigration, they may lose the values of their home culture and experience the difficulties of adaptation and psychological distress (Weng, 2016). The new challenges that arise through acculturation intensify psychological adjustment, where one experiences changes in cultural identity or the achievement of satisfaction (Ward & Kennedy, 1999; Weng, 2016).

Different aspects of an individual's self-identity are modified to adapt to the new culture, and social and psychological changes occur with continuous interactions between individuals from different cultural backgrounds; such a process is referred to as acculturation (Berry, 1997; Ryder, Alden, & Paulhus, 2000). Four modes of acculturation exist: integration, assimilation, separation, and marginalization (Berry, Kim, Minde, & Mok, 1987). These four modes are determined by how an individual identifies oneself in the dominant or original culture. Ji (2007) stated that acculturation is one of many factors that differentiates between parenting

involvement, parenting practices, and parenting stress of Asian parents. Further, a preference for using language at home affects relational and disciplinary issues between immigrant parents and their adolescent children (Ji, 2007; Tseng & Fuglini, 2000).

Many studies have examined the relationship between acculturation and the parenting of immigrant Chinese parents in the United States. Lin and Fu (1990) reported that immigrant Chinese mothers showed adjustment in their parenting values that was more like those of Americans, while Chiu, Feldman, and Rosenthal (1992, cited in Ji, 2007) indicated that Chinese “immigrant adolescents perceived greater parental control and more parental involvement in youth decision-making after the move to a new country” (p. 34). Another study showed that lower acculturation was associated with less satisfaction among Chinese immigrant mothers for the parenting role (Buki, Ma, Strom, & Strom, 2003; Ji, 2007). Verbosity was defined as a dysfunctional parenting style in which parents escalate their verbal responses to children’s negative behaviors (Hulei, 2002). No association was found between level of acculturation and level of verbosity among Chinese immigrant mothers (Hulei, 2002). Bornstein and Cote (2004) conducted similar studies on Japanese and South American mothers, but research on Korean American parents’ acculturation and parenting involvement is scarce. Understanding the phenomenon of childrearing practices or beliefs of Korean American parents will extend the previous relevant research on Korean Americans’ perspectives of academic achievement.

This study was designed to analyze which acculturation stage Korean American parents fall into and how it affects their parenting philosophy of mathematics education. Though many studies have explored the association between acculturation and parenting of Chinese American mothers, a better understanding is needed of how Korean immigrant parents redefine academic achievement in mathematics while they adjust their own individual cultural values, and how they

preserve supportive relationships with their children. In this study, Korean American or Korean immigrant parents are individuals who were born in Korea and migrated to the United States or born in the United States with Korean heritage.

To comprehend the mathematical performance of minority immigrant students in the United States, especially Koreans, it is imperative to understand Korean parents' perceptions of mathematics education and their parenting support of their children's mathematical achievement as a result of cultural changes. A study claimed that "immigrant parents often go back and forth between their own experiences learning mathematics in their home country and what their children are experiencing in their new country" (Civil, Planas, & Quintos, 2012, p. 81). A deeper understanding of acculturation for Korean American parents and how their parenting beliefs develop will provide insights into the phenomenon of "Tiger Mother" as well. Adjusting to a new culture and social values can be a challenging experience, and even more difficult for parents in childrearing (Castro, 2012). Understanding how Korean American parents' level of acculturation influences Korean American students' education will be valuable for those who work with a similar demographic.

Purpose of the Study

The purpose of this study was to examine the development of the parenting philosophy of Korean American parents on mathematical learning, and how acculturation influences their involvement in their children's mathematics education. To achieve this purpose, the study aimed to answer the following research questions:

1. What cultural beliefs or practices of Korean American parents contribute to their children's mathematical learning?

2. How are immigration experiences associated with Korean American parental involvement in their children's mathematical learning and achievement?
3. To what factors do Korean Americans attribute their parenting and educational expectations in mathematics achievement?

Procedure of the Study

Middle and high school students begin assuming responsibilities for selecting the level and type of courses they take, yet such processes are influenced by their parents (Useem, 1992). Since these students' placements, especially in more advanced mathematics classes, are related to parental involvement in decision making (Ekstrom, Goertz, & Rock, 1988), the participants of this study were Korean American parents whose children were currently enrolled or had been enrolled in mathematics classes. The sample was obtained through advertising on social media online and posting a link to a survey on Korean American parent group websites. In addition, invitations were sent out to local high schools in New York City and throughout Korean Christian and Catholic churches and Buddhist temples. Emails were also sent out to the Korean American Association in the New York area. The names of the participants were entered into a raffle to win Starbucks gift cards.

After reviewing the research literature, the researcher created a three-part survey, in both Korean and English. The first part of the survey collected demographic information including but not limited to parents' educational background, mathematics educational background, age, number of children, length of stay, and occupation.

The second part of the survey determined the level of acculturation of Korean American parents. They were assessed on their validation of Korean cultural values by using the Suinn-

Lew Asian Self-Identity Acculturation Scale (SL-ASIA) (Suinn, Ahuna, & Khoo, 1992) and the Asian Values Scale-Revised (AVS-R) (Kim & Hong, 2004).

The third part of the survey contained 5-point Likert scale questions to help understand how much the values of the Korean culture influenced parental involvement in their children's mathematics education. Survey questions for this part used the Family Involvement Questionnaire, a multivariate assessment of family participation in early childhood education (Fantuzzo, Tighe, & Childs, 2000).

The last part of the survey examined Korean American parents' general perspectives of and attitudes toward mathematics education. Survey questions were structured using the Fennema-Sherman Mathematics Attitudes Scales, an instrument designed to measure attitudes toward the learning of mathematics by females and males (Fennema & Sherman, 1976); Attitudes Toward Mathematics Inventory (Tapia, 1996); An Instrument to Measure Mathematics Attitudes (Tapia & Marsh, 2004); and The Inventory of Parental Influence (IPI) (Campbell, 1996).

Qualitative data were collected in semi-structured interviews with a subgroup of the selected sample. Each interview consisted of two parts, following the composition of the initial quantitative survey. Interviews were conducted in English or Korean at the convenience of participants, and were audio recorded and transcribed. In the first section of the interview, the participants were asked to explain in detail their experience as immigrants. Parents who were born in the United States were asked to describe their parenting experience as through a bicultural identity and indicate whether their parents' childrearing had influenced their own parenting practice. Then the participants were asked to elaborate on their beliefs and their formation and development. In the second part of the interview, additional questions were asked to identify any relation between children's mathematical learning and Korean Americans'

parenting beliefs due to acculturation. Also, they were asked to describe their experience in mathematics education and their expectations for their children's mathematical learning in the United States for any factors that might have affected their acculturation experience.

The first research question was addressed by the answers to the fourth part of the survey and responses to the second part of the interview. The aim of this section was to find common parenting practices or beliefs among Korean American parents regarding mathematics education, how Korean immigrant parents' expectations of their children's attainment in mathematics were formed, and the reasons for it by identifying attributing factors or experiences. Moreover, how parental involvement progressed while the parents themselves experienced cultural changes was closely examined.

To answer the second research question, the answers to the second and third parts of the survey and the first and second parts of the interviews were analyzed. Using the SL-ASAI and AVS-R, the levels of acculturation of participants were determined first. The responses to the third part of the survey was to determine how much Korean cultural values impacted parental involvement regarding mathematics learning. The analysis was used to understand possible deriving factors that led to such parenting beliefs of the Korean parents in the United States, any relation to their experience as immigrants, and factors that control children's mathematics education. The aim of this section was to find how the acculturation level of Korean American parents affects parental involvement in children's mathematical learning.

The last research question was answered by using the interviews. Participants were given opportunities to provide more in-depth clarification of and justification for their answers. The goal of this section was to determine whether different values of mathematics education affected the parents' level of acculturation or even resulted in frustration and difficulties in parenting.

The approach of Interpretive Phenomenological Analysis (IPA) allows for a more comprehensive understanding of a situation or the interpretation of phenomena related to participants' behaviors or perspectives on a major life, even in qualitative research. The interviews in this study were analyzed using IPA. Because the study involved each immigrant's experience and how each interpreted the experience, IPA was useful since it realized the topic of a study that is "dynamic, subjective, relatively under-studied, and where issues relat[e] to identity" (Nguyen et al., 2014, p. 52). IPA also allowed "the detailed examination of human lived experience...[and a] human lived experience examination in a way that enables the experience to be expressed in its own terms, rather than according to predefined category systems" (Smith, Flowers, & Larkin, 2009, p. 33). The goal was to identify and analyze any additional commonalities among Korean American parents' explicit contributions to advancing their children's mathematical education while their cultural values and identity were being modified.

Chapter II

REVIEW OF LITERATURE

Introduction

Asian parents' philosophy of childrearing practices has created controversy among parents and educators in the United States in recent years. After Amy Chua published *The Battle Hymn of the Tiger Mother* in 2011, several studies have discussed the childrearing practices of Asian immigrant parents in different countries besides the United States. The current relevant literature on this topic is reviewed and summarized in this chapter.

This chapter consists of five sections. The first section discusses how this study was based on the framework of Urie Bronfenbrenner's ecological theory of human development. The second section reviews studies on immigrant minorities by education researchers. In the third section, the definitions of acculturation and different modes of acculturation in the literature are explored. The fourth section compares perspectives of East Asian countries and Western countries on mathematics education. Finally, the last section examines the current research on cultural models in mathematics.

Ecological Theory of Human Development

This study approached childrearing in the mathematics education of a minority ethnic group with an ecological perspective of human development. Ecological ideas were implied in the works of Plato and Aristotle in conceptions of the processes of growth and development (Duncan, 1965). In 1975, Bronfenbrenner advocated a contextual emphasis on the ecology of human development that is a study of continuous and interrelated development in a person's

ability to perceive, conceptualize, and interact on different levels in complex environments

(Bronfenbrenner, 1979). He formally defined this perspective as follows:

The ecology of human development involves the scientific study of the progressive, mutual accommodation between an active, growing human being and the changing properties of the immediate settings in which the developing person lives, as this process is affected by relations between these settings, and by the larger contexts in which the settings are embedded. (p. 21)

Bubolz and Sontag (1993) added that human ecology focuses on the social interaction and interdependence of humans with the cultural environment that can impact human behavior, development, and quality of life. The ecological framework provides a justification for considering human ecological variables that influence interrelationships between the family and social-cultural environments which, in turn, affect an individual's development of changes (Bronfenbrenner & Crouter, 1982). Further, the interaction between the environment and a person is reciprocal in that the individual reforms the residing milieu (Bronfenbrenner, 1979).

Bronfenbrenner's model provides a framework for examining how intrafamilial processes are impacted by extrafamilial situations and settings (Bubolz & Sontag, 1993). Unlike Freud and Erikson, Bronfenbrenner (1979) argued that a person's developmental processes are not restricted to "a single, immediate setting but [are] extended to incorporate interconnections between such settings, as well as external influences emanating from the larger surroundings" (p. 22; see also Arnett, 2015). On the basis of proximity, Bronfenbrenner (1979) proposed four level of environmental systems that influence a developing person: microsystem, mesosystem, exosystem, and macrosystem. Figure 1 shows this multidimensional system.

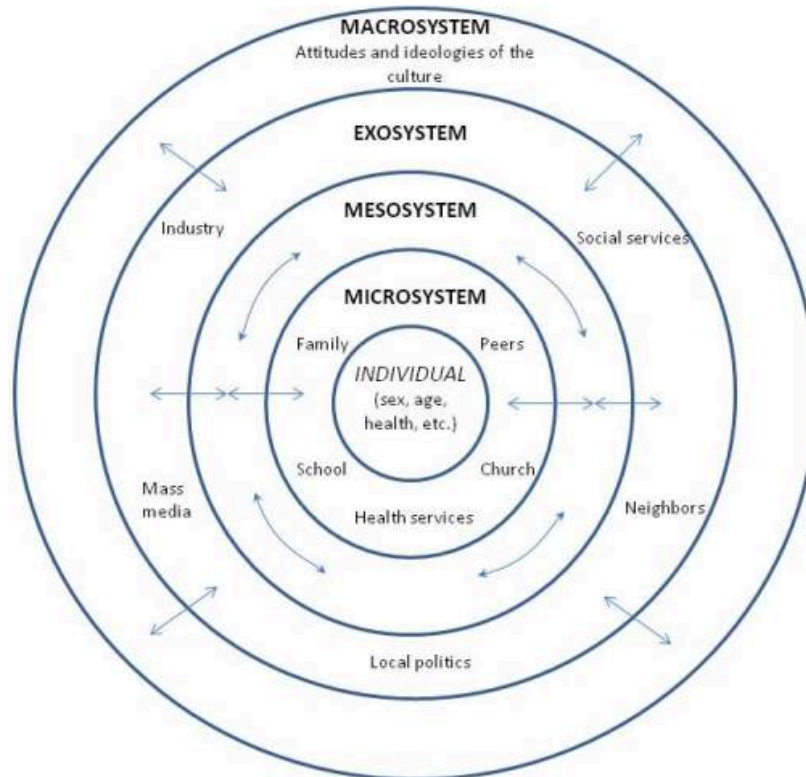


Figure 1. Bronfenbrenner's (1977) ecological theory of human development

These systems are interrelated and embedded inside of one another, with microsystem being the most immediate context to an individual and macrosystem being the outermost. First, a microsystem is referred to as “a pattern of activities, roles, and interpersonal relations experienced by the developing person in a given setting” (Bronfenbrenner, 1979, p. 22) that directly impacts the individual's development the most. Second, a mesosystem describes interconnections and interactions among two or more microsystems. Third, an exosystem is comprised of one or more societal settings that impact the person's development indirectly. Finally, macrosystem refers to “consistencies, in the form and content of lower-order systems (micro-, meso-, and exo-)” (p. 26), with underlying cultural beliefs and values. The blueprints of this system vary based on different socioeconomic, ethnic, religious, and subcultural groups while suggesting contrasting intrasocietal beliefs and lifestyles (Bronfenbrenner, 1979). Further,

the term *macrotime* explicates the changes of “expectations and events in the larger society, both within and across generations, as they affect and are affected by, processes and outcomes of human development over the life course” (Bronfenbrenner & Morris, 2007, p. 796).

Bronfenbrenner (1986) then proposed an additional system, the chronosystem, which examines an individual’s development of changes and continuities over time related to the changing environments. The system emphasizes two types of life transitions: “normative (school entry, puberty, entering the labor force, marriage, retirement) and nonnormative (a death or severe illness in the family, divorce, moving, winning the sweepstakes)” (p. 724). These transitions arise throughout the lifetime, serving as stimuli for developmental changes, directly and indirectly, that influence family processes (Bronfenbrenner, 1986). Bronfenbrenner then differentiated family processes into three successive levels: social address model, process-context model, and person-process-context model. The social address model is especially pertinent to this study because it examines developmental outcomes of adults in contrasting environments based on geography or social background.

Ecological transitions occur when a person’s position is adjusted in the ecological environment throughout the life span (Bronfenbrenner, 1979). Emigration is one example of ecological transitions in a macrosystem, and Bronfenbrenner (1986) reported that the impact of geographic mobility on family functioning is lacking in current human ecology research, especially in newly immigrant families’ experiences with respect to values, customs, and socioeconomic status.

Elder (1974, 1985) examined a more advanced form of chronosystem that concerns the cumulative effects of a complete sequence of developmental transitions over a person’s lifetime and refers to such phenomena as the life-course. The framework of the life-course provides

valuable insights into how dynamic social changes shape an individual life, such as social-economic experiences, residential mobility, neighborhood structures, family composition, employment patterns, diverse stressors, and immigration (Elder & Shanahan, 2007). In addition, Elder and Shanahan argued that the way the accumulation of individual social life patterns affects social institutions can be derived from the life-course framework, and that life-course theory and the ecology of human development share interrelated objectives and concepts such as multilevel developmental structures (Elder & Shanahan, 2007).

Immigrant Minorities

Suárez-Orozco and Suárez-Orozco (2001) defined immigrants as being “in the margins of two cultures” and “paradoxically, they can never truly belong either ‘here’ nor ‘there’” (p. 92). Immigrants not only experience language barriers, but also cultural differences and pressure to assimilate into the dominant country’s lifestyle. Research has reported that common major issues experienced by immigrant minorities are deficient knowledge of the language and culture of the host country as well as unstable immigrant status which triggers conflicts with the host country’s natives and evokes racial discrimination due to differences in ethnicity and culture (Rong & Preissle, 1997).

Immigrant minorities are defined as “those who have more or less willingly moved to the United States because they expect better opportunities...than they had in their homelands or places of origin” (Ogbu & Simons, 1998, p. 164). Ogbu¹ and Simons (1998) categorized minorities into three groups based on historical and cultural factors: autonomous, voluntary

¹ Ogbu’s cultural-ecological (CE) theory of minority student performance had shortcomings. For example, Foster (2004) pointed out that Ogbu’s analyses: (a) have no indication of “the existence of involuntary minority high-achievers whose motivations to strive and succeed are rooted in their experiences as community participants” (p. 377); (b) have no adequate “account for the range of academic behaviors and orientations among both involuntary and voluntary minorities” (p. 378); (c) “relied upon a vision of culture that lacks nuance and complexity” (Foster, 2005, p. 568); and (d) missed “aspect of the immigrant/voluntary minority circumstance” (p. 568).

(immigrant), and involuntary (nonimmigrant) minorities. African, Cuban, Chinese, Indian, Japanese, Korean, Central and South American, Caribbean, and Mexican immigrants are considered voluntary minorities in the United States. The members of this group do not have lifelong difficulties in academic achievement, culture, and language (Ogbu & Simons, 1998) and view learning and acculturation in a “multidimensional fashion whereby new skills and values are incorporated into the old culture, transforming but not replac[ing] it” (Gibson, 1987, p. 274). Another study described these immigrants as strongly determined to succeed in the new country because they recognize cultural and language differences as obstacles that they try to overcome so they are not discriminated against by mainstream society (Kim, 1993). Further, these minority group members form an adaptive cultural model whereby they promote additive identity. Researchers have described that immigrants with additive identity construct an adaptive cultural model, whereby they adjust themselves to meet the expectations of the main society while maintaining their original culture and identity (Kim, 1993). Gibson (1988, cited in Kim, 1993) called this phenomenon “accommodation without assimilation” (p. 227), and a cultural model of Korean American immigrants is a good example of this type of adaptation (Gibson & Ogbu, 1991; Kim, 1993).

Ogbu and Simons (1998) defined involuntary minorities as “people who have been conquered, colonized, or enslaved...the nonimmigrants have been made to be a part of the U.S. society permanently against their will” (p. 165). American Indians, Alaska Natives, Mexican Americans, Native Hawaiians, Puerto Ricans, and African Americans are examples of involuntary minorities in the United States (Ogbu & Simons, 1998). They experience more continuing difficulties in culture, language, and school, and believe learning and acculturation are a “linear fashion leading ultimately to assimilation” (p. 274), and that loss of original cultural

traditions and identities occurs because of school learning (Gibson, 1987). These caste-like minorities show signs of struggle with oppositional identity and cynicism against dominant culture (Gibson & Ogbu, 1991; Kim, 1993). Hence, there needs to be a contribution to the research to help immigrants connect their home culture with the host culture with coherent and smooth transitions so they have opportunities to progress their potentials fully in learning mathematics (Gorgorió, Planas, & Vilella, 2002). In addition, the research has argued that with “clear intention of acknowledging the student’s culture and the culture of the group” (p. 26), mathematics teachers can create a learning environment with continuity and coherence between the two distinct cultures. However, Gorgorió et al. (2002) claimed that the transition process can be either beneficial or detrimental, and the process should allow immigrants to adapt while not giving up their previous cultural meanings and values and to reinterpret those values when needs arise.

Asian Immigrants

Parenting cognition refers to “parents’ beliefs, attitudes, goals, and knowledge regarding their parenting, and work to motivate and organize parenting activities and moderate the effectiveness of their child-rearing practices” (Cheah, Leung, & Zhou, 2013, p. 31). With an increase in a heterogeneous student body, it is important to understand what kind of background parents are coming from and how they encourage their children.

Among East Asian cultures, education is so highly underscored that Asian American students still face high expectations in academic success even in the United States (Fan, 2001). However, Reay’s study in 1998 noted that immigrant mothers also face difficulties when challenged to gain more knowledge about schooling for the benefit of their children (Civil et al., 2012). A strong affiliation exists between acculturation modes and childrearing among

immigrants. Because parenting styles are associated with children's learning outcomes (Castro, 2012), studying how parenting styles adjust to a dominant country's social values is useful.

When raising children, factors such as maternal education, social support, and acculturation—categorized as potential protective factors—influence Asian American mothers' parenting practices, involvement, and aggravation (Ji, 2007). Carreón, Drake, and Barton (2005) argued that most immigrant parents highly value their children's education. They further explained that a relationship between parenting practices with cultural capital, such as beliefs, material resources, social networks, and personal life orientations, may be helpful in understanding parental involvement. Language, cultural capital, and social networks especially are the three elements that influence immigrant parents' power in authority and schooling (Carreón et al., 2005). The authors described language as a medium of identity and power, and because of unfamiliarity with English, immigrant parents often depend on their children, resulting in a change to the authority figures in the immigrant household. Moreover, immigrant parents in general have very little information on “invisible codes of power” in U.S. school cultures (Delpit, 1988, cited in Carreón et al., 2005), such as a school's organization and curriculum and their privileges as parents (Carreón et al., 2005). Lastly, the study claimed that because of long work hours with limited schedule flexibility and unwelcome treatment by school administration, some immigrant parents experience diminished opportunities in networking with other parents.

Gibbs, Shah, Downey, and Jarvis (2017) reasoned that the Asian American advantage in cognitive skills is due to a favorable family socioeconomic status, immigrant background, and parenting. First, the authors explained that parents with higher education attribute more educational resources to their children, and the achievement gap between Asian American and

Caucasian American is largely due to socioeconomic status. However, while the Asian American advantage in reading and verbal skills could be explained by parents' socioeconomic status, the gap in mathematics skills cannot be. The study further added that the socioeconomic factor was limited in explaining the advantage of Asian American subgroups, such as Chinese, Korean, and Southeast Asian American students. Second, because of the strong desire to improve their social, economic, and educational status, Asian immigrant parents emphasized socioeconomic advancement via high academic achievement. The grades of Asian immigrant students were indeed higher than U.S.-born Asian American students after controlling for socioeconomic status and parental involvement, indicating that "immigrant drive" may have contributed to the Asian American advantage (Gibbs et al., 2017). The authors further described that Chinese immigrant children's drive to succeed in school was to validate their parents' sacrifice in the new country. Chao (2000) referred to Chinese American parenting style as training that includes intensive parental control and involvement as well as concern for academic success. The authors added that Indian and Pakistani parents showed similar characteristics.

In relation to socioeconomic status, Lareau (2002) claimed that class differences were evident in childrearing practices because of parents' economic resources. She explained that the combination of parents' educational background, life experiences and resources, economic resources, and occupational conditions was influential to childrearing strategies. The study also observed that parents' values and behaviors differed according to whether they were middle class, working class, and poor. Lareau noted that "differences in family life lie not only in the advantages parents obtain for their children, but also in the skills they transmit to children for negotiating their own life paths" (p. 749). Further, she described that working-class and poor

parents wished to provide more activities for their children to give “protection from harm rather than to cultivate the child’s talents per se” (p. 772).

Lastly, Gibbs and colleagues (2017) described parenting in two dimensions: abstract ideals (attitude and beliefs) and tangible behaviors. In their study, Asian American parent styles were described with high levels of abstract ideals and low levels of tangible behaviors. In other words, Asian American parents had higher expectations of school performance, but lower participation in school events and organizations or interactions with their children than non-Asian parents.

Korean Americans

According to the 2010 U.S. Census, Korean Americans are the fifth largest Asian group in the United States. From 2000 to 2010, the number of Korean Americans increased from 1,228,427 to 1,706,822, which is approximately an 38.9% increase (U.S. Bureau of the Census, 2010). One of the top causes of Korean migration to the United States was better educational opportunities for the children (*Los Angeles Times*, 1992, cited in Farver & Lee Shin, 2000). Because of the sacrifice of moving to another country, these immigrant parents have higher than usual expectations in the academic success of their children. In fact, educational attainment has been emphasized so much in Korean society that families with middle or high school children spend about 30% of their household income on private education (Lee, 2005). According to the Library of Congress Country Studies in 1990, the government of Korea has provided free college education since the 16th century. East Asian countries, such as China, Japan, Korea, Mongolia, and Vietnam, commonly share the values of Confucianism, which emphasize the importance of education. In this Confucian culture, education was extremely valued as a way to achieve personal and societal development (Bae, 1991) and this belief is deeply rooted in Korean culture.

In addition, the Organization for Economic Co-operation and Development (OECD) reported in 2011 that Korea was the third highest among OECD countries for total expenditure on education. After the Korean war, as more American soldiers were stationed in South Korea, more Koreans were exposed to Western culture. In turn, an increasing number of Koreans decided to migrate to Western countries for additional education and opportunities. Studies have shown that Korea's growth level of education accelerated the country's economic growth (Park, 2007). Korea's historical positive image of the United States contributed to forming a general cultural model of Korean Americans; when Koreans' cultural values such as education and hard work are combined with their belief in opportunities and fair prospective remuneration in the United States, they believe that dual identity is additive, not oppositional or incompatible (Kim, 1993). Studies have also shown that Korean American members' social model of accomplishment is so embodied in Korean undergraduate students that they make specific major and career choices, such as medicine, law, or engineering (Kim, 1993).

Even though education has been highly valued in Korean culture, the language barrier is still the greatest concern for most immigrant parents. English is a required course for all secondary school students in Korea, meaning most newly immigrated Koreans are familiar with the language. However, despite their high reading and writing skills, conversational skills are so lacking that many immigrant parents experience discrimination in employment (Park, 2007).

Besides the difficulties of learning the new language, interdependence affects the acculturation of Korean Americans. Korean immigrants tend to have a more grounded ethnic connection and self-identity compared to other Asian immigrants (Min, 1995). Further, Korean Americans are likely to settle down in cities where Korean enclaves already exist (Hurh, 1998). While these attributes for new Korean immigrants may be advantageous, their subsequent

homogeneity and separation from the domain society may generate complications to integrate into both cultures (Shin, Bayram-Ozdemir, Lee, & Cheah, 2010).

The economic accomplishments of Korean immigrants in the United States have been ascribed to their high-level education before migration (Lew, 2004). Farver and Lee-Shin (2000) argued that even among immigrant individuals with the same racial background, acculturation styles differ greatly, and families and children are affected by such a process. The authors then reported that the parenting attitudes and behaviors of Korean immigrants are altered based on the host country's cultural values. Integrated immigrant mothers are constantly challenged in their thinking processes and the development of values, especially when they have frequent interactions with the dominant culture; because of differences in functionalities of cultural values, they cannot maintain both Korean and American standpoints (Farver & Lee-Shin, 2000). Therefore, the authors concluded that the integration of these mothers is "compartmentalized so that some areas of their lives are 'Korean-like' and some are 'American-like', but not everything can be a conglomeration of the two sets of beliefs and values" (p. 330). A study reported that "individual Korean-American immigrants modify their parenting attitudes and behaviors based on the values of the host culture" so that studying how parenting differences in mathematics education are related to acculturation is crucial.

Farver and Lee-Shin (2000) argued that Korean immigrant parents' distinct adjustment in attitude towards parenting is associated with different acculturation style. The difference arises in struggles to change their reference frame from relational to aggregate modes; the former mode refers to "group interdependence, sensitivity to others, and a collective orientation" (p. 319), while the latter indicates "independence, self-reliance, autonomy, and an individualistic orientation" (p. 319). Other possible differences are due to conflicts that occur in family values,

parent-child relationships, parenting styles, and stronger attachments and associations to Korean traditions than any other Asian American groups (Min, 1995, cited in Farver & Lee-Shin, 2000).

Kim (1993) posed three major theoretical views in explaining minority students' academic performance: biological, cultural, and structural. As for the cultural attribute, the author noted that when minority social esteem is consistent with that of the dominant society, minority students' adjustment in school is easier than when cultural values are incompatible.

In other research, Korean American parents held less control of their children and were more responsive when they accepted more of the host culture (Kim, Cain, & McCubbin, 2006). Further, acculturation was measured by the use of English at home in Ji's (2007) study, which concluded that the greater use of English was correlated to higher involvement in school functions and less parenting practice of harsh discipline.

The Korean cultural value of accentuating education as one principal means to a higher social position and the Confucian tradition of respecting teachers and complying with parents are suppressed by Korean immigrant parents (Kim, 1993). Researchers have argued that these values help immigrant children accomplish better academically. However, Lew (2004) reported that the high school dropout rate of working-class Korean American students is high because their parents' immediate guidance and support are absent due to long work hours.

The Korean American cultural model considers wealth and reputation as measures of success; thus, most immigrant parents maintain their own businesses and force their children to obtain professional careers after attending prestigious universities (Kim, 1993). This belief is very apparent among Korean immigrants as parents' pressure becomes socially admissible. Kim reported that children thus unconsciously adopt these cultural values, which then become part of

the immigrant children's identity; they consider high academic achievement as an intrinsic aspect of being Korean.

The psychology of a child's caretaker builds a cultural environment for a child's development (Harkness & Super, 2002). The immigrant parents' childrearing goes through changes because of the acculturative experience and parenting values of both traditional and dominant society's customs (Cheah et al., 2013). As a result, their children's developmental outcomes are influenced differently than those of nonimmigrant children. With access to the parenting strategies of both traditional and new countries, immigrant parents possess the most ideal parenting values and practices (Bornstein & Lansford, 2010). As the cultural identities of these parents are modified in the host country, understanding how parenting acculturation relates to children's mathematical studies is imperative.

Immigrant Parents of Other Ethnic Groups

The research literature has reported that one out of five public school students' parents are immigrants (Baolian Qin, 2006), and recognizing potential struggles of immigrant parents in the domain society is imperative as they are the most influential individuals for children. Each immigrant's identity is reformed and influenced by cultural dislocation and social mirroring (Suárez-Orozco & Suárez-Orozco, 2001). Not only do immigrant children need to adapt to attain their identities in a new host country, but parents also need to adapt and negotiate their parenting beliefs and practices to provide balanced support and promote a child's development while accommodating both societies' cultural values (Cheah et al., 2013; Qin, 2008). Most immigrant parents force their children to acquire capabilities to survive in the new country while preserving original traditions (Suárez-Orozco & Suárez-Orozco, 2001). As Asian immigrants have a higher tendency to preserve their traditional values than other groups of immigrants, these parents

encounter additional challenges (Bornstein & Cote, 2006; Chao & Tseng, 2002; Cheah et al., 2013).

Because of the cultural belief that excelling academically advantages socioeconomic status, Asian immigrant parents seek a variety of educational resources upon arrival to a new country. Hsin and Xie (2014) stated that ethnic-specific supplementary learning outside of school, private tutoring, college preparation programs, additional information regarding college entrance, and the education system are more easily available for new Asian immigrants than for other immigrant communities. Nevertheless, the advantage of cultural and social resources declines over generations of Asian Americans, and more assimilated first and second generations benefit than later generations (Hsin & Xie, 2014).

For instance, even after migrating to the United States, Chinese parents expect their children to be controlled, disciplined, and obedient. While this behavior is commonly accepted in China, these cultural values and control of their children's education and future development are also commonly found among Chinese immigrant parents (Baolian Qin, 2006). After studying Chinese American families, Baolian Qin defined alienation, in which immigrant parents and children become emotionally distant and lack significant interactions and communication. While this occurrence is also common among nonimmigrant parents and children in the United States, the study found that it is more prominent in immigrant families (Baolian Qin, 2006). In another study, Cheah et al. (2013) interviewed 50 first-generation Chinese American mothers and learned four cultural differences between Chinese and U.S. parenting: (a) strict and harsh discipline with behavioral controls to enforce children's compliance versus regulatory reasoning; (b) inclination to utilize social comparisons with other children to rectify their misbehaviors versus reassurance and promote confidence with positive attitudes; (c) accentuation on a sense of interdependency

and correspondence between Chinese parents and their children versus independency in U.S. parenting; and (d) importance of academic achievement for financial stability, career success, and better socioeconomic status versus focus on physical improvement, positive social abilities, and improvement of their socioemotional advancement. The research indicated that these Chinese immigrant mothers acknowledged their traditional childrearing practices did not provide adequate adjustments in the dominant society, resulting in changes in their parenting practices so that their children could grow more autonomous. While some mothers put less emphasis on academic performance after migration, some discussed enabling their children to pick and develop their interests, as opposed to diminishing their attention on scholarly accomplishment (Cheah et al., 2013). Cheah and colleagues further pointed out that Chua (2011) correctly portrayed Chinese mothers' parent-focused objectives, harshness, and strictness for childrearing. However, the researchers concluded that Chinese mothers in the study supported and endeavored to accomplish well-balanced parenting practices in both Chinese and U.S. societies, rather than what was depicted by Chua. Chinese immigrant parents who combined giving independence with collectivistic cultural values of interrelatedness illustrated the socialization of the autonomous-related self (Kağıtçibasi, 2003). Further, as opposed to interpreting independence and interrelatedness as a perfect inverse, it is essential to acknowledge the peculiarity and conjunction of the two measurements among Asian immigrants (Cheah et al., 2013).

China and the United States have distinct beliefs and cultural ideologies about learning, education, and parent involvement in their children's learning. In the United States, learning is about gaining knowledge to further understand the world; develop individual abilities; refine emotional and social adjustment; and achieve one's goals through skills, interest, and commitment (Cheung & Pomerantz, 2011). In China, in addition to knowledge itself, learning is

about the responsibility of parents to not let their children fall behind academic standards, and experience “continual self-improvement to attain moral ideals such that diligence, persistence, and concentration, as well as enduring hardship” (p. 933). Thus, Chinese parents believe that more control and less autonomy support are superior childrearing practices, regardless of their children’s desire (Cheung & Pomerantz, 2011; Chua, 2011). Even though the level of American and Chinese parents’ involvement in children’s learning differs, both groups’ involvement decreases as children get older (Cheung & Pomerantz, 2011). The reason for this decline is that American children wish for more independence, while Chinese children become more accountable for their own learning to meet their parents’ expectations (Cheung & Pomerantz, 2011). The study further assumed that Chinese parents use both psychological control to emphasize their expectations and autonomy support as children engage in meeting expectations.

Similarly, Louie (2001) discussed the characteristics and causes of Chinese immigrant parents’ expectations, parenting strategies, and investments in education. Regardless of socioeconomic status, these immigrant parents deeply value and emphasize education because greater opportunities and postsecondary education are available in the United States than in China, and a college degree represents higher income and less racial discrimination (Louie, 2001).

Traditional cultural values in education among the Hmong were similar to those of the Chinese. Hmong American parents believed that by reinforcing the importance of education, their children will not be too Americanized and will become model students, maintain cultural traditions, and speak the heritage language (Ng, Lee, & Pak, 2007). Also, Schneider and Lee (1990) indicated similar behaviors among other East Asian parents regarding controlling and monitoring their children’s academic achievement and social activities, and even teaching simple

mathematics skills before children start kindergarten. The research showed that East Asian parents monitored and constructed their children's use of time for studying or activities outside of school, and spent more time in private lessons in music or language schools (Schneider & Lee, 1990). They also reported that "East Asian parents have encouraged their children to pursue medical and technical professions, which are relatively less language based than other kinds of high-level professions" (p. 374). Asians who are professionals in the field of science are also known as the "middleman minority" (Kim, 1981; Kitano, 1976, cited in Schneider & Lee, 1990).

East Indian American parents experience a higher conflict with family members when acculturated with separation or marginalization than those who are acculturated with integration or assimilation (Farver, Narang, & Bhadha, 2002). Gibson's (1987) study portrayed examples of newly arrived East Indian immigrants, who tended to be more highly educated and work in professional job fields, and how their children achieved high academic performance. However, Gibson also explained that Punjabi Indian immigrants, who are agricultural laborers and farmers or factory workers, have high persistence and desire for the academic achievement of their children. Similar to other immigrant parents, Punjabi parents also emphasized studying and extremely limited socializing and extracurricular activities for their children. However, when Punjabi students did not perform well academically, the parents' attitude differed slightly: children learn only if they desire to do so and the educational system is not at fault (Gibson, 1987). Another unusual characteristic of Punjabi parents from other immigrant parents was that they were aware of and presumed discrimination and prejudice against themselves in every society, not just the United States (Gibson, 1987). Nevertheless, the study commented that the American education system was more inexpensive, easily accessible, and more equitable, compared to the home country of Punjabis. Similar to studies on Chinese parents in the United

States, Gibson stated that Punjabi parents were concerned about their children being assimilated and neglecting original cultural traditions.

Asian Indian, Chinese, Korean, Cuban, Nigerian, and Armenian immigrants are considered hyper-selected groups, meaning they are more likely to be college graduates than those in home countries and the general population in the United States (Tran, 2017). The second-generation children of these groups have more advantages in terms of educational and socioeconomic attainment than other second-generation immigrant groups and third or higher generations of White and Black populations (Tran, 2017). Tran's theoretical concept of the hyper-selectivity of Chinese immigrants underscored the Asian race's mobility, ethnoracial identification, educational achievement, and the social construction of races in the United States. As the most highly educated and the largest Asian immigrant group, the hyper-selectivity of Chinese immigrants has influenced the perception of Asian ethnic groups that has prompted the racial mobility of other Asian ethnic groups, due to the impact of the racialization process on academic achievement (Tran, 2017). As about 80% of Asian American adults are born outside of the United States, the hyper-selectivity of immigrants needs to be emphasized for its impact on the social construction of different races in the United States (Tran, 2017). Not only focused on the Chinese, the study indicated that the high educational achievement of first-generation Cubans, Nigerians, and Armenians has affected the second generation's postsecondary education attainment. Further, Tran reported that these Chinese immigrants "with high levels of education and socioeconomic resources create ethnic capital in the form of supplemental education programs, SAT prep courses, and tutoring services that are accessible to working-class co-ethnics" (p. 3).

In a study focusing on the beliefs of immigrant parents, Asian American parents expected their children to attain graduate or professional degrees, while European American or Latino parents expected college degrees (Okagaki & Frensch, 1998). However, the study also found that European American parents were more confident than Asian American or Latino parents in assisting their children to be successful in school. Unlike Asian American parents, Latino parents put more emphasis on developing children's autonomous and conforming behaviors in their childrearing practice (Okagaki & Frensch, 1998). A study of Latino immigrant parents found that they also experienced hardships from discrimination, poverty, uncertainty, and mistreatment, but viewed the new country as an opportunity to create new identities for the benefit of their children's education (Carreón et al., 2005). Mexican American parents believed racial barriers and children's perceptions of barriers were related in terms of the success of their children (Okagaki, Frensch, & Dodson, 1996). Despite their major presence in the minority immigration population and their active involvement in school functions, the Latino parents interviewed in the study acknowledged feeling "disrespectful, distant, and confused" (Carreón et al., 2005, p. 495; Tran & Valdez, 2017). Nevertheless, Tran and Valdez (2017) recognized that the second generations of Latino groups, including Cubans, Central Americans, South Americans, and Colombians, Ecuadorians, and Peruvians (CEPs), have accomplished equivalent educational achievements as native Whites.

Abreu, Cline, and Shamsi's (2002) research compared the participation of White British and Pakistani British parents in their children's mathematical education. The first major difference was the mathematical concepts which parents thought they were responsible to teach their children at home. White British parents helped their children in counting and simple addition or subtraction, but passed responsibility for their children's mathematics education to

the school. Meanwhile, Pakistani British parents emphasized the learning of times tables which was deeply imbedded in Pakistan schools, and the parents developed and prepared mathematical studies that were not related to school work but used their own resources. With mathematics help at home, there was more frequent involvement between siblings than with parents in Pakistani families because Pakistani parents experienced language barriers and perception of less familiarity with school mathematics. By contrast, mothers mainly helped with children's mathematics work in the White British group.

Finally, Pakistani-British parents reported that they had fewer informal meetings with their mathematics teachers due to language barriers and therefore lacked self-proficiency in English, which they felt constrained their responsibilities for their children's mathematics education and their expectations of the home-school relationship that differed from school practice. Abreu et al. (2002) reported that due to this limitation of receiving information about school mathematics, the main source of information was obtained from the children. Although these parents were able to describe the mathematical topics that their children were learning at the time, they still did not have information on mathematics placement in the National Curriculum.

A common trait of all these immigrant parents from a variety of studies was that they expected children to succeed in the American educational system as they believed this was the only upward social mobility to pursue, yet they advised against adopting the beliefs or behaviors of other young Americans. Immigrant parents encouraged their children to assimilate and acculturate in education, but not in the dominant culture. Chen and Stevenson (1995) stated that Asian American high school students, however, were not significantly concerned with or psychologically damaged by their parents' high academic expectations and standards. The

literature reviewed in this section reflects a “cultural-motivational theory of academic achievement” (p. 1233). According to Chen and Stevenson, families of immigrants hold “beliefs and attitudes that lead to [a] high level of motivation and achievement-related behaviors reflect a cultural heritage that emphasizes education and the ability of all persons to benefit intellectually from diligent application of effort” (p. 1233). However, the authors concluded that these beliefs, attitudes, and motivational levels are modified as the acculturation process takes place and the cultural values of the dominant society take over the original.

Cohn, Livingston, and Wang (2014) reported that immigrant mothers were more likely to be stay-at-home mothers than U.S.-born mothers—40 % to 26%, respectively. Further, Hispanic and Asian mothers were most likely to be home with their children—38% and 36%, respectively—due to a high rate of immigration among these two groups, with 86% of Asian mothers and 60% of Hispanic mothers born outside of the U.S. The research also revealed that stay-at-home mothers have more time on leisure and childcare activities than working mothers.

Acculturation

Acculturation refers to the process whereby social, cultural, beliefs, values, behavior, and psychological changes arise, and the degree to which much of the original culture is maintained and the dominant culture is adapted due to the intercultural setting of ethnic minority individuals (Berry, 2003; Farver, Xu, Bhadha, Narang, & Lieber, 2007; Phinney, 1996). These ethnic minority individuals adapt to acculturation psychologically and socioculturally (Ward, 1996). The former adaptation describes a person’s well-being and mental health, whereas the latter adaptation denotes one’s social competency in an intercultural environment. Many researchers have agreed that active interaction in both the original culture and the dominant culture is the “most adaptive mode of acculturation and the most conducive to immigrants’ well-being”

(Berry, Phinney, Sam, & Vedder, 2006, p. 306). Each immigrant individual responds differently to maintaining the original culture when moving to a new environment. Replacing their original values completely with new values does not occur because most immigrants adapt at varying paces and with varying styles (Phinney & Devich-Navarro, 1997).

Based on the degree to which people desire to maintain their heritage culture, identity, and association with the larger society (Berry et al., 2006), the literature has described four modes of the acculturation process. The first mode is assimilation, whereby an individual prefers to adopt and interact more with a dominant culture than the original culture (Berry et al., 2006). In this particular acculturation style, immigrants usually reject their own culture. With an increasing number of immigrants, more research on the association between levels of acculturation and parenting has been published. Farver and Lee-Shin (2000) found that Korean American mothers showed higher acceptance and encouragement when they assimilated than did the other three acculturation modes mentioned below. On the other hand, the work of Suárez-Orozco and Suárez-Orozco (2001) claimed that immigrant children have an extreme desire to assimilate because of a desperation for acceptance and a strong longing for the new culture, while their parents are more concerned about children being Americanized and demonstrating such behaviors as disrespecting authority, undervaluing education, and promoting violence. She further argued that because of too many linguistic and cultural obstacles, first-generation immigrants cannot fully assimilate into the dominant society. The second and third generations completely adapt so that they “[disappear] into the mainstream culture” (p. 91), which is considered a way of moving up in the dominant society.

Second, separation occurs when one chooses to maintain the original culture while refusing to be involved with the larger society (Berry et al., 2006). Children whose immigrant

parents are in this acculturation process are found more often with frequent psychological problems than those whose parents accept both the original and host cultures (Barankin, Konstantareas, & de Bosset, 1989; Koplow & Messinger, 1990; Minde & Minde, 1976).

The third acculturation style is marginalization, which defines a state in which an individual seeks neither one's original cultural maintenance nor involvement in a dominant society (Berry et al., 2006). Korean American parents who are acculturated with separation or marginalization were found to be highly stressed (Berry et al., 1987).

Lastly, integration exists when an individual is involved in the larger society while preserving the original culture (Berry et al., 2006). Individuals who have integrated are considered bicultural and the most adaptable. Several studies have indicated that immigrants experience less social anxiety, stress, and psychological problems when "integration" occurs (Berry & Kim, 1988; La Fromboise, Coleman, & Gerton, 1993; Sam & Berry, 1995). However, integrated Korean American mothers expressed more frustration in parenting followed by higher control over their children and lack of confidence in creating a learning environment at home than other assimilated, separated, or marginalized mothers (Farver & Lee-Shin, 2000). Asian Indian immigrant families experienced fewer family conflicts along with higher academic achievement, self-esteem, ethnic identity, and better psychological adjustment for their adolescent children when they had an integrated acculturation style (Farver et al., 2007). Other studies have indicated that regardless of the immigrant parents' efforts, they continued to feel like outsiders due to structural forces in the new society and completely changed their viewpoints of the world in sensing they belonged neither to home nor new country (Carreón et al., 2005).

Acculturation is one major measure, besides maternal education and social support, in predicting immigrant mothers' expectations and involvement in their children's academic

achievement (Ji, 2007). As immigrant children's behaviors are affected by their mothers' acculturation processes (Farver & Lee-Shin, 2000), the term *Tiger Mother* in North America has raised questions about any possible associations between immigrant parents' acculturation styles and parenting practices. Amy Chua published her memoir *Battle Hymn of the Tiger Mother* as well as an article entitled "Why Chinese Mothers are Superior" in *The Wall Street Journal*. She argued that Chinese parents enforce hard work, discipline, persistent memorization and repetition, and rote learning to produce "successful kids," "math whizzes," and "music prodigies." The Chinese parenting style then raised questions about the American education system and the Western parenting style, which accepted mediocre academic performance due to low expectations. While Chua (2011) acknowledged this effective Chinese parenting style was because of the Chinese cultural model of educational attainment, Lee and Zhou (2014) argued that children's exceptional educational outcomes were actually due to "the intergenerational transmission of socioeconomic advantage and middle-class cultural capital" (p. 39). The authors further stated that the educational accomplishment of immigrant children could not be explained either by the status attainment model or the cultural capital model. They proposed "ethnic capital" and "ethnic resources" to better understand the high educational aspirations and mobility outcomes of the children of Asian immigrants with low SES.

Other research has developed different concepts of the behavior patterns of immigrant parents and children after migration. While parents' high expectations of their children's academic performance and the success of immigrant families have been positively associated, Asian immigrant families still encounter challenges in fully adapting to the dominant culture, mainly the Caucasian culture (Ji, 2007; Lee, 1996; Liu & Li, 1998). Portes and Rumbaut (2001) found that dissonant acculturation arose because children learned and adapted a new language

and culture at a faster rate than their parents. This acculturation gap between parents and children generated greater alienation. Meanwhile, Gibson (1987), Ogbu (1987), and Suárez-Orozco and Suárez-Orozco (2001) discussed the immigrants' process of experiences in the new country as a dual frame of reference in both the perceptual and comparative sense. Immigrant parents' dual frame of reference is quite distinct from that of their children. Even with the physical and psychological stress that native-born Americans may not be able to tolerate, most immigrant parents remain appreciative of new opportunities and are optimistic for the future, and the struggles they face in the new country become more tolerable and preferable to what they had in the old country (Suárez-Orozco & Suárez-Orozco, 2001). To the contrary, immigrant children, especially those who were born in America or moved at an early age, compare their living situation to those of Americans. While they learn the language and adapt to the new culture quickly and more easily than their parents, these children feel deprived and less privileged when comparing their lives to the main society's lifestyles and living quality (Suárez-Orozco & Suárez-Orozco, 2001).

Based on the idea of dissonant acculturation and the dual frame of reference, Baolian Qin (2006) developed a concept called "parallel dual frames of reference," where immigrant parents compare their children to children in their home country, and immigrant children compare their parents to American parents. She added that structural and linguistic barriers intensified alienation between parents and children, especially more so in middle-class than working-class immigrant families.

White and Kaufman (1997) stated that the educational outcomes of minorities were also affected by level of acculturation. The authors further argued that Hispanic immigrants' high school graduation rates increased with generation. Suárez-Orozco and Suárez-Orozco (2001)

mentioned Richard Rodriguez's autobiography about his mother who struggled to move upward in the main society, and so instead transferred her own ambitions to her children and encouraged them to be well educated, which she recognized would bring better opportunities.

Research has shown that immigrant students have higher academic achievement when taught by teachers who can speak the students' native language and are familiar with the culture (Neseth, Savage, & Navarro, 2009). When studying mathematics, cultural differences may enact as obstacles or resources in constructing students' social and individual identities (Zevenbergen, 2003).

The immigrant parents' perceptions of mathematics education help to better understand their children's perspectives and achievement in mathematics since the learning opportunities are often mounted by the parents' expectations (Civil et al., 2012). To investigate any similarities or differences within the group of Korean American parents' styles of acculturation and their behaviors towards mathematics education, the present research assumed that parents have similar immigrant experience in each acculturation process.

Comparison of Mathematics Education in East Asian Countries and Western Countries

Studies have shown that Asian immigrants in the United States largely consist of engineers and scientists or family members of immigrants who moved in the 19th century by invitation (Tsang, 1984). The former group tended to maintain a higher socioeconomic level and contribute more effort in achieving higher education for upward social mobility. Studies have also suggested that "Asian Americans have deliberately adopted a strategy of overinvesting in education to offset discrimination and obtain upward mobility" (p. 117), so as a result, they chose mostly to study science or mathematics subjects that do not require high competency in language.

Asian American students have positive attitudes toward studying mathematics and value education more, compared to Caucasian American, Chinese, and Japanese students (Chen & Stevenson, 1995). Because of contrasting traditional cultural values, Leung (2001) stated that mathematics education's underlying values, features, and teaching practices in classrooms are distinct in East Asian and Western countries.

Leung (2001) presented the six characteristic contrasts of mathematics education in East Asian countries versus Western countries to re-evaluate traditional cultural values in East Asian countries and build an identity of East Asians' own mathematics education so as to position themselves on the international scene. The first dichotomy is that while Western countries are more driven with "process" as an active construction of gaining knowledge and learning mathematics, East Asians view mathematics as the product, where a distinctive knowledge structure needs to be formed. The second difference is "meaningful learning" versus "rote learning." Leung pointed out that students are encouraged to understand information in Western countries, whereas East Asians stress memorization and repetitive practice without committing to understanding the underlying concepts first. The third dichotomy is that while learning is regarded as a pleasurable and enjoyable experience for those in Western countries, it is viewed as a serious endeavor accompanied by hard work that leads to a successful life, pleasure, and satisfaction in East Asia.

Leung (2001) provided extrinsic versus intrinsic motivations as the fourth difference. Intrinsic motivations are valued when learning mathematics by Western educators. However, a high emphasis on examinations continued to exist in East Asia because it is considered to be a way to discern students' abilities. Therefore, a strong emphasis is put on high examination scores which work as a motivation for students' learning. Fifth, Western culture values independence

and individualism, in that mathematical instruction and learning are usually individualized and promoted unless financial limitations arise. On the other hand, because of the importance of social orientation in Eastern culture, mathematics is taught as a group teaching, usually to a large class. Lastly, the author compared the competencies of Western and Eastern mathematics teachers. The former group is primarily expected to be competent in pedagogy, especially among elementary school mathematics teachers. In the latter group, profound subject knowledge and deep understanding of mathematical fundamentals are more stressed than pedagogy.

Cultural Models in Mathematics

Previous research has associated mathematics performance with students' cognitive abilities or teachers' instructional qualities. However, mathematics educators would also benefit from enhancing classroom management skills by understanding the high educational attainment of second-generation Asian students from a cultural and societal perspective. According to White (1956), culture is divided into four categories: ideology (beliefs), sociology (customs), sentiment (attitudes), and technology (tools). D'Ambrosio (1984) also connected the concept of culture and mathematics with a cultural group "which has developed practices, knowledge, jargons and codes (in particular to encompass the way they mathematise)" (Barton, 1996, p. 1036).

Bishop (1994) and Bishop, Clements, Keitel, Kilpatrick, and Laborde (1996) stated that sociological and cultural dimensions in mathematical knowledge have been valued increasingly among mathematics education researchers since the end of the 1970s and the beginning of the 1980s. In particular, mathematical knowledge from anthropological, historical, and socio-psychological perspectives have been emphasized in research. The cultural anthropology of mathematics and mathematics education is defined as ethnomathematics (Bishop et al., 1996), The groups of people who participate in the specific practices construct the particular

mathematical knowledge socially, and these knowledge and practices are related to the cultures, values, and customs of different ethnic groups (Bishop, 1994). He further explained that “a general lack of understanding of mathematics as cultural knowledge, and a lack of awareness of any values underlying mathematical knowledge” (p. 15) generate an assumption of cultural consonance. Some degree of cultural conflicts and alienation occurs in formal mathematics education, which is a process of cultural interaction, especially for ethnic minorities and second language learners in Westernized societies (Bishop, 1994).

As differences exist between cultural groups in cultural values and beliefs, so are certain elements considered as mathematical. Wilder (1950, cited in Bishop et al., 1996) stated that during earlier historic times, these elements “varied so much that what was called ‘mathematics’ in one culture would hardly be recognized as such in certain others” (p. 269). Barton (1996) argued that to develop anthropological perspectives on mathematics, the working concepts of mathematical writings need to be redefined. Of the seven mathematical writing categories that he defined, the anthropology of mathematics in cultural groups can be seen in the following: “Mathematics in Cultural Settings: descriptions of activities which are particular to a cultural grouping, but which might be described as ‘mathematical’” and “Descriptions of the Culture of Mathematics: writing which has mathematics as the subject but which is in another mode” (p. 1039). A question such as how mathematics relates to other features of one particular culture is considered in these two categories of writings (Barton, 1996). Further, the author denoted that due to increasing migrants from China, Korea, and Malaysia to the Pacific Rim countries, more mathematics practitioners and educators have sought cultural interfaces and linguistic influence in mathematics, and stressed that every culture’s mathematics or understanding of mathematical

concepts reflect the fundamental nature of the culture of the time. Therefore, the mathematics curricula and practices of different cultural groups are also studied further to amend mathematics education that underlines various cultural traditions and values (Ascher, 1991).

Wong, Taha, and Veloo (2000) stated that cultural values, ethnic composition, and customs affect the essence and practice of mathematics education. However, Crafter (2012) indicated that studies which focused on parental involvement generally disregarded until recently the various cultural backgrounds of students and their parents. More researchers have examined parents' attributes in a culturally diverse environment, and concluded that social, economic, and ethnic status influence how parents comprehend their children's mathematics learning due to their past educational and life experiences, and changes to methods or strategies in the mathematics curriculum since they attended school in their country of origin (Crafter, 2012). These factors generate different representations of mathematics at home than at school. The research further explained that mathematics practices at school usually do not aim to reflect or value practices at home, but rather marginalize those home practices which are not denoted by White, middle-class families (Crafter, 2012).

Gibson and Ogbu (1991) argued that studying the cultural model is valuable for understanding the effect of family and community on children's academic achievement. The cultural model can be described as "understandings that are widely shared among members of a society or segment of society regarding how their society or any particular domain or institution works and where they fit into that working order" (Kim, 1993, p. 226). This cultural model works as a structure for understanding educational experiences and behaviors in the schooling process (Kim, 1993).

Many studies have discussed immigrant children and their academic performance and behaviors. As these children are in the margins of different cultures, conflicts over identity issues are very common (Suárez-Orozco & Suárez-Orozco, 2001). Immigrant children experience cultural difficulties both inside and outside the classrooms. In relation to identity, Civil et al. (2012) argued that understanding cultural and ethnic identity formation among low-income immigrant students is essential for creating differentiated instruction for mathematical learning.

Crafter (2012) presented theoretical concepts of cultural models that are embedded in parental resources in their children's mathematics learning. Cultural models are a form of patterns that classify people's experiences, and these patterns are "neither very general nor specific but tend to relate closely to a person's own experiences and sociocultural context" (p. 34). Crafter argued that mathematical learning originates with a knowledge that is based on family or community practices; hence, studying the development of cultural models is valuable. Cultural models are associated with cultural practices and may be expounded in different ways based on the variety of cultural experiences (Crafter, 2012).

Based on the research of immigrant children who learned English as a second language and whose parents practiced mathematics that was different from school, Abreu et al. (2002) concluded that students with parents who were more confident in making the transition process easier for their children tended to have more successful achievement in mathematics.

One needs to consider the connection between knowledge and values in order to understand methods of learning and the use and transfer of knowledge in a particular social group (Abreu et al., 2002). Further, the authors reported that "it is the association of mathematical practices with particular social groups that provides the framework for

understanding the value groups attach to their own mathematical practices” (p. 124). By recognizing and approaching mathematics as a cultural product that provides opportunities for cultural diversity in mathematics classrooms, all immigrant and non-immigrant students can benefit from a variety of enriching mathematical learning sources (Gorgorió et al., 2002).

Chapter III

METHODOLOGY

This chapter describes the methodology employed to address the research questions of this study. Further, this chapter elaborates on the sample selection process, research design, data collection, and data analysis procedures that were used.

Research Questions

The purpose of this study was to examine the parenting acculturation of Korean American parents and its impact on their children's mathematics education. The research questions were:

1. What cultural beliefs or practices of Korean American parents contribute to their children's mathematical learning?
2. How are immigration experiences associated with Korean American parental involvement in their children's mathematical learning and achievement?
3. To what factors do Korean Americans attribute their parenting and educational expectations in mathematics achievement?

Sample

Demographics and Sample

The research sample selection is purposeful in this qualitative study and such a method is known as purposive or judgment sampling (Gay, Mills, & Airasian, 2006; Merriam, 1998; Patton, 2002). When selecting research participants for this study, the researcher used a purposeful sample procedure since "purposeful sampling is based on the assumption that the

investigator wants to discover, understand, and gain insight (about a particular phenomenon) and therefore must select a sample from which the most can be learned” (Merriam, 1998, p. 61).

The aim of this purposeful sampling selection of parent participants was to disclose similarities in the immigration experience and concerns of immigrant parents, and how their acculturation levels were associated with their children’s mathematics education while also explicating diversely of each parent’s perspective.

The sampling strategy used in this study was criterion-based and homogeneity sampling. According to Patton (2002), criterion sampling strategy is useful in identifying research participants who meet essential predetermined criteria with standardized questionnaires for in-depth interviews. He explained that homogeneity sampling strategy is suitable for selecting participants for a focus group and studying them in depth.

Since this research study intended to examine Korean American parents’ immigration experience, acculturation level, and changes in participation in their children’s education upon arrival in the United States, the research participants were limited to Korean-descent parents living in the United States. Also, as this study focused on mathematics education, the sample was restricted to Korean American parents whose children were currently enrolled in a mathematics course at the time or had taken at least one mathematics course within the past 3 to 5 years in middle or high school. To be eligible to start the online survey, everyone was asked to input the mathematics course that their children took at the time or had taken previously. The sample for this study was 44 Korean American immigrant parents with children who took at least one mathematics class. Of the 44 total participants, there were 4 males and 40 females. Of all possible participants, 98% were married and 2% ($n = 44$) indicated “Prefer not to answer.”

Selection Criteria for Selected Subsamples

After gathering a sample of 44 parents, the sample was divided into three groups. Based on the answers to Part II: Self-Identity Acculturation survey questions and the SL-ASIA scale, the participants' levels of acculturation were identified. The first group of parents with high scores reflected high acculturation and identified as "Western identified" or "assimilated." The second group consisted of participants with low scores represented low acculturation and identified as "Asian identified" or "separated." The last group consisted of those with middle scores were identified as "bicultural" or "integrated."

All participants in the online survey were entered in a raffle to win one of three \$50 Starbucks, Dunkin' Donuts, or Amazon gift cards. Every interviewee received incentives in the form of \$30 gift cards to Starbucks or Amazon at the conclusion of the interview process, and the incentive was intended only as gesture of appreciation.

Research Design and Instruments

Overview and Development of Quantitative Survey

The study used mixed methods by employing both quantitative and qualitative research. The instrument used for quantitative research was a 10-question demographic survey and a 32-question survey divided into two parts. The first part consisted of 24 questions measuring acculturation level. These questions collected information about the participants' level of acculturation adopted, as per the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA) (Suinn et al., 1992). This instrument was modeled on the Acculturation Rating Scale for Mexican Americans (ARSMA) and was developed to measure an individual's cultural coordination towards Asian and Western culture in the areas of language, identity, and social interaction. To

measure the behavioral acculturation of Korean Americans, the instrument was modified as directed by the authors and validated by experts in the mathematics education field.

The researcher initially considered using the Asian Values Scale-Revised (AVS-R) (Kim & Hong, 2004), but the instrument was intended to measure the degree of adhering to values of the Asian culture in a psychological aspect, and this was determined as not appropriate for this study.

The SL-ASIA has 21 items, with five new ones added by the authors of the original scale. This instrument intended to measure the following attributes of acculturation: “language (4 questions), identity (4 questions), friendship choice (4 questions), behaviors (5 questions), generation/geographic history (3 questions), attitudes (1 question)” (Sunn et al., 1987, p. 402). Each item allows a participant to choose one answer out of five possible answers. To measure the level of acculturation, the participants’ answers for all 21 items were added and then divided by 21. Each score therefore ranged from 1.00 to 5.00, where 1.00 represented low acculturation and 5.00 represented high acculturation.

In addition to the score analysis, participants had the opportunity to identify themselves as “very Korean,” “bicultural,” or “very Westernized” in question number 20. Then, questions 22 to 24 in the survey were adapted from the new items added to the SL-ASIA scale. The scoring system differed, compared to the first 21 items. Questions 22 and 23 used a 5-point Likert scale from 1 (not fitting in at all) to 5 (fitting in very well). If a participant marked “4” or “5” on question 22¹ and “1,” “2,” or “3” on question 23,² then the classification was “Korean-identified.” If a participant marked “1,” “2,” or “3” on question 22 and “4” or “5” on question 23,

¹ Question 22: Rate yourself on how well you fit when with other Koreans (Use the scale below, where 1 indicates that you do not fit and 5 indicates that you fit very well).

² Question 23: Rate yourself on how well you fit when with other Americans who are non-Koreans (Use the scale below, where 1 indicates that you do not fit and 5 indicates that you fit very well).

then the classification was “Western-identified.” If a participant marked “4” or “5” on both questions 22 and 23, the classification was “bicultural.” Lastly, if a participant marked “1” or “2” on both questions 22 and 23, the person was denying any identification and was alienated from both Korean and Western cultures. The scores to these two questions were called “SL-ASIA behavioral competencies score,” where fitting into a specific culture “reflects the presence of behaviors that enables such a fit” (Suinn et al., 1992, p. 2). Table 1 shows the scoring system for questions 22 and 23.

Table 1

Scoring System for Questions 22 and 23

		Answers to question 22				
		1	2	3	4	5
Answers to question 23	1	N	N	A	K	K
	2	N	N	A	K	K
	3	(W)	(W)	(B)	K	K
	4	W	W	W	B	B
	5	W	W	W	B	B

K = Korean identified
 B = bicultural
 W = Western identified
 N = neither (alienated)

Question 24 asked, “There are many different ways in which people think of themselves. Which ONE of the following most closely describes how you view yourself?” and the authors intended it to measure the “SL-ASIA self-identity score.” Table 2 shows how each answer identified and categorized the participants.

Table 2

SL-ASIA Self-identity Score

Answer	Category
a. I consider myself basically Korean. Even though I live and work in America, I still view myself basically as a Korean.	Korean self-identified
b. I consider myself basically as an American. Even though I have a Korean background and characteristics, I still view myself basically as an American.	Western self-identified
c. I consider myself as a Korean-American, although deep down I always know I am a Korean.	Bicultural, Korean self-identity
d. I consider myself as a Korean-American, although deep down, I view myself as an American first.	Bicultural, Western self-identity
e. I consider myself as a Korean-American. I have both Korean and American characteristics, and I view myself as a blend of both.	Bicultural, bicultural self-identity

The second part consisted of eight questions on parents' attitudes and beliefs about Korean and Western mathematics education. In the SL-ASIA, two items measured a level of belief in cultural values such as "Rate yourself on how much you believe in Asian values (e.g., about marriage, families, education, work)" and "Rate yourself on how much you believe in American (Western) values." These two questions were modified such as "Rate yourself on how much you believe in Korean values about mathematics education" and "Rate yourself on how much you believe in Western values about mathematics education" to measure Korean immigrant parents' beliefs in mathematics education for each culture. A participant answered using a 5-point Likert scale from 1 (do not believe) to 5 (strongly believe). Suinn et al. (1992) stated that these items can re-examine the data and reclassify or recategorize the sample as well.

Similar to question 8, "Whom do you now associate with in the community?" or question 9, "If you could pick, whom would you prefer to associate with in the community?" participants were asked about the importance of Korean or Western values in mathematics education. For instance, questions were "Whom do you now associate with in the community to obtain

information regarding your child’s mathematical education?” or “If you could pick, whom would you prefer to associate with in the community to obtain information regarding your child’s mathematical education?”

Lastly, in the second part, participants were asked to rate any changes in expectations for their children’s mathematical achievement using a 5-point Likert scale from 1 (lower expectation) to 5 (higher expectation). Scores for classifying the participants are presented in Table 3.

Table 3

SL-ASIA Score Classification

	Question Numbers in SL-ASIA	Question Numbers in the Survey
SL-ASIA behavioral competencies score	24, 25	22, 23
SL-ASIA self-identity score	26	24
SL-ASIA values score	22, 23	Part II: 5, 6

The breakdown of the online survey questions is shown in Figure 2 below, and the actual survey questions can be found in Appendix B.

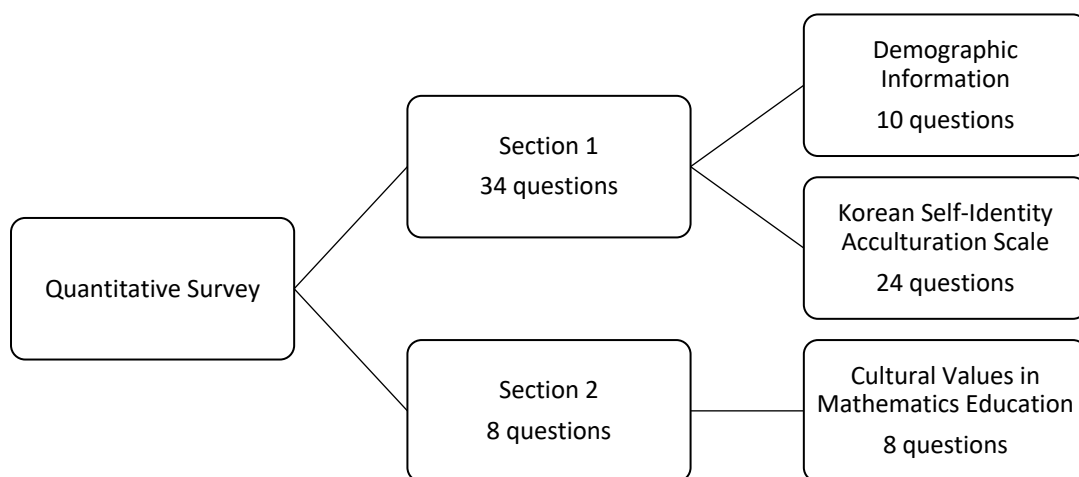


Figure 2. Breakdown of quantitative data

Overview and Development of Qualitative Semi-structured Interviews

Bloomberg and Volpe (2012) stated that “one of the basic tenets of qualitative research is that each research setting is unique in its own mix of people and contextual factors” and a “researcher’s intent is to describe a particular context in depth, not to generalize to another context or population” (p. 20). Therefore, to answer research questions about how Korean American parents at different acculturation stages valued mathematics education and to understand their reasoning for their parenting practices in the United States, the researcher used semi-structured interviews.

To gain deeper understanding and rich data as well as to address the research questions, qualitative methods were necessary. Bloomberg and Volpe (2008, quoted in Arnold, 2013) argued that the features of qualitative research are as follows: “(a) understanding the processes by which events and actions take place, (b) developing contextual understanding, (c) facilitating interactivity between researcher and participants, (d) adopting an interpretive stance, and (e) maintaining design flexibility” (p. 50). Also, qualitative methodology is used when comprehensive understandings of a situation, interpreting phenomena of participants’ behaviors and point of views in natural settings as in a set of circumstances, and reasons and effects of such behaviors are needed (Creswell, 2007; Denzin & Lincoln, 2005). Lastly, participants’ social situations and interactions can be examined and offer a more holistic understanding by allowing the interviewer to enter their world (Bloomberg & Volpe, 2012).

All of the interviews were transcribed. The researcher then coded the transcripts with the qualitative data analysis software NVivo, which organized the interview responses and analyzed them to find patterns and similarities by common themes. Interview questions were organized in five categories: Immigration Background, Mathematics Perception, Mathematics Home Practice,

Tiger Mother Characteristics, and Korea vs. U.S. (see Appendix C for Interview Template). The interview responses were first organized by the interview questions, and then into subcategories. Each subcategory had several codes with common themes (see Appendix H for categories and coding). For example, terms mentioned by the participants, such as immigration experience, unfamiliarity with school system, language barrier, or cultural differences, were grouped under the category “Immigration.”

These characteristics were suitable for a detailed understanding of Korean immigrants’ experiences as parents dealing with mathematics education, their social interpretation of mathematics learning in two different sociocultural worlds, and transitions in the home-mathematics culture. Also, the intent of extracting and interpreting the phenomena of Korean American parents’ expectations and perceptions on mathematics achievement was accomplished by qualitative research.

Data Collection

The study collected two main forms of data. The first form of data was an online survey that consisted of three sections. The first section asked questions on the research participants’ demographic information such as education, immigration duration, and field of profession.

One of the purposes of the online survey was to select participants for in-depth interviews. Another purpose of the online survey was to find Korean American parents who were willing to participate in the study.

The survey was created using an online survey tool, TC Qualtrics. In June of 2017, the researcher posted a link to an online survey on Facebook groups such as Research on the Education of Asian and Pacific Americans (REAPA), Young Korean American Network (yKAN), Young Korean American Network Parents (yKAN Parents), Columbia Alumni

Association Korea, Columbia University Korean Graduate Student Association, Teachers College Korean Graduate Student Association, and San Francisco Korean Parents. In addition, the survey was posted on Teachers College's Message Center, Korean American Women's Community Website MissyUSA, and various Korean American Church group websites.

The purpose of the survey was to identify candidates for the second part of the study. The second section of the online survey asked questions about the immigration period, academic background, acculturation level, and attitudes toward Korean and Western mathematics education.

After the parents' responses to the online survey were recorded, reviewed, and analyzed, the researcher conducted the second part of the study. This second part consisted of in-depth interviews including questions about their experiences as immigrant parents, any changes in parenting practices and beliefs, and their perspectives on mathematics education after moving to the United States.

Interview questions were structured beforehand (see Appendix C for interview questions). They were merely used as a guide so that if any new ideas or interest in the topic emerged, the interviewer could obtain appropriate and more individualized data and explicate each interviewee's experience related to the topic with follow-up questions. During the interviews, depending on the research participants' answers, follow-up questions were posed. The interview questions elicited data about Korean Americans' experience, beliefs, and behaviors toward mathematics education as immigrant parents in the United States.

From 44 responses to the online survey, 10 parents volunteered to participate in in-depth interviews which were conducted face-to-face (FtF). FtF interviews in qualitative research establish a good rapport and collect a significant information through research participants' body

language and intonation (Arnold, 2013; Hatch, 2002; Opdenakker, 2006). Patton (1990) and Hatch (2002) also reported that qualitative interviews allow one to figure out what is on the participants' mind and bring out their unawareness of their environment, thoughts, and experiences. The parents were asked first to describe their experience as immigrants, such as difficulties or changes in their parenting beliefs or practices. Then, the second part of the interview consisted of questions on why they enforced high mathematical achievement and how their educational values were adjusted in the new country. The interview process is illustrated in Figure 3.

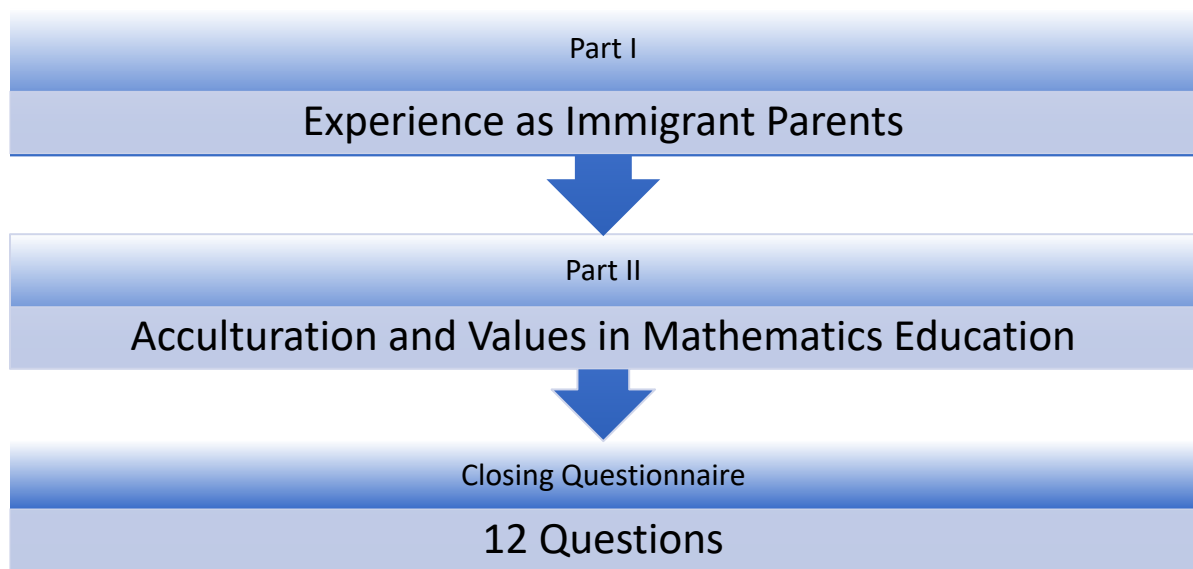


Figure 3. Breakdown of qualitative data

Interviews were audio recorded for the purpose of transcribing and further analysis. The interviewer took notes on comments about the interviewees' responses for future reference. Some interviews were conducted via Skype for easy accessibility to the research participants.

After the interviews, participants were asked to fill out a 12-question questionnaire. This questionnaire adapted questions from the instrument *Attitudes Toward Mathematics Inventory (ATMI)* developed by Tapia and Marsh (2004). This inventory was intended to measure attitudes

toward mathematics with four factors: self-confidence, value, enjoyment, and motivation. To measure how much Korean American parents valued mathematics education, the following six questions from the ATMI were selected, as shown in Table 4.

Table 4

Selected Questions From ATMI

Question	Question
1	Mathematics is a very worthwhile and necessary subject.
2	Mathematics is one of the most important subjects for people to study.
3	High school mathematics courses would be very helpful no matter what my child decides to study. (Original statement – High school math courses would be very helpful no matter what I decide to study.)
5	I expect my child to take as much mathematics as he/she can during his/her education. (Original statement – I plan to take as much mathematics as I can during my education.)
7	I believe studying mathematics helps my child with problem solving in other areas. (Original statement – I believe studying math helps me with problem solving in other areas.)
8	A strong mathematics background could help my child in his/her professional life. (Original statement – A strong math background could help me in my professional life.)

Data Analysis

Quantitative and qualitative data were both used for analysis. The researcher conducted the quantitative data analysis using the online survey responses. Once the online responses were collected, the researcher changed the data into numerical forms for easier analysis. Then, the survey participants were divided into three subsamples: “assimilated,” “separated,” and “integrated,” and statistical analysis was performed. Descriptive statistics (mean, median, mode, interquartile range, and standard deviation) were utilized for each question and each sample to

examine Korean American parents' differences in acculturation level and their standpoint on mathematics education after immigration. Additionally, hypothesis testing was performed using the t-test, one-way ANOVA test, the Mann-Whitney U test, and a correlation coefficient matrix; the quantitative data were statistically analyzed.

Interviews were semi-structured to provide additional evidence supporting the findings from the quantitative data analysis. Therefore, qualitative methodology was suitable for analyzing perceptions and issues derived from an in-depth investigation of parents' beliefs and practices.

Lincoln and Guba (1985) stated that data collection methods are flexible and adaptive in the naturalistic inquiry of qualitative research. Interviewees were asked open-ended questions in this study to better understand their beliefs, experiences, and changes in attitudes toward mathematics education after relocating to the United States.

The researcher used the transcripts of interviews and coding to examine similarities or patterns among the responses. The common themes considered in the responses were acculturation, assimilation, separation, bicultural, and mathematics.

Chapter IV

FINDINGS

This chapter aims to answer the research questions about Korean American parents' cultural beliefs and childrearing practice in mathematics education by analyzing quantitative and qualitative data.

The quantitative data were collected through the survey and statistically analyzed using descriptive statistics through the software SPSS. The qualitative data were collected through interviews with 10 Korean American parents who were selected from the survey participants.

Preliminary Survey Data Analysis

Demographics Information

A total of 44 Korean American parents participated in the survey. The general demographics of the participants are described in this section. Four males and 40 females participated in the survey. The sample population consisted of Korean American parents, with 88.6% having lived in the United States 10 years or more and 84.1% of the sample population's children having lived in the United States 10 years or more. A more detailed breakdown can be found in Appendix F.

Of the survey participants, 56.8% had bachelor's degrees, forming the largest group, followed by 22.7% with master's degrees. As shown in Table 5, the rest of participants indicated high school or equivalent, some college, or doctoral degree as the highest level of education completed.

Table 5

Highest Level of Education

	n	%
High school or equivalent	3	6.8
Some College	3	6.8
Bachelor's Degree	25	56.8
Master's Degree	10	22.7
Doctoral Degree	3	6.8
Total	44	100.0

Those participants with Bachelor's degrees or higher majored in the following: Nursing, Medicine, Accounting, Business Administration, Management Information System, Fashion, Family Studies, Special Education, Museum Education, Mathematics, Social Welfare, Political Science, Business Administration, Violin, Liberal Arts, TESOL, International Political Economy, Korean Language and Literature, and English Language and Literature.

About 59.1% of participating parents completed their highest level of education in Korea, while the other 40.9% completed their highest degree in the United States.

About 20.5% (n = 9) of the participants indicated that they lived in other countries beside Korea and the United States, such as Australia, Canada, China, France, Japan, New Zealand, Netherlands, and the United Kingdom.

The majority of the participants (56.8%) were homemakers, followed by being employed at 40.9%. Of those who were employed, 6 participants worked in a medical field, 3 in education, 1 in finance, 2 in the arts, and 6 in other fields such as religion or administration. Only one participant was a student.

Mathematics Education Survey Results

The participants' general thoughts about mathematics education are described in the following tables. Table 6 shows that the general sample tended to communicate with their children more in Korean than in English. About 18.2% communicated only in Korean, about 20.5% used both languages almost equally, and about 4.5% communicated only in English. About 45.5% of the participants indicated that they used mostly Korean and some English, as shown in Table 6.

Table 6

Responses to "What language do you use when communicating with your child?"

	n	%
Korean only	8	18.2
Mostly Korean, some English	20	45.5
Korean and English about equally	9	20.5
Mostly English, some Korean	5	11.4
Only English	2	4.5
Total	44	100.0

After moving to a new country, obtaining new information is imperative but can be challenging for some minorities. As seen in Table 7, about 88.6% indicated that they associated with Asians and the Korean American community, while 9.1% associated with Asian and Anglo groups equally to get information on their children's mathematics education. Parents were then asked which group they preferred to interact with to find mathematical resources. About 50.0% of the general sample preferred to associate with Asian and Korean American groups, and 47.7% preferred Asian and Anglo groups equally. A significant difference existed between parents'

current interacting groups and preferred groups to communicate with. This difference from current to preferred community to associate with reflected that Korean American parents desired to interact more in the dominant society while still maintaining a relationship with the original community.

Table 7

Response to “Whom do you now associate with in the community to obtain information regarding your child’s mathematical education?” and “If you could pick, whom would you prefer to associate with in the community to obtain information regarding your child’s mathematics education?”

	Now		Preferred	
	N	%	n	%
Almost exclusively Asians, Korean Americans	17	38.6	8	18.2
Mostly Asians, Korean Americans	22	50.0	14	31.8
About equally Asian groups and Anglo groups	4	9.1	21	47.7
Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups	1	2.3	1	2.3
Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups	0	0	0	0
Total	44	100.0	44	100.0

Despite the differences in the educational systems of Korea and the United States, about 66% of Korean Americans indicated that they referred to Korean books or websites as resources for their children’s mathematics education. As shown in Table 8, about 34% parents used American educational resources more than Korean educational resources.

Table 8

Responses to “Which educational resources for mathematics do you refer to?”

	n	%
Exclusively Korean	5	11.4
Mostly Korean, some American	18	40.9
About equally Korean and American	6	13.6
Mostly American	7	15.9
Exclusively American	8	18.2
Total	44	100.0

Korean American parents tended to value both Korean and American cultures about equally regarding mathematics education. As shown in Table 9, about 88.7% parents respected Korean values a moderate amount or more regarding their children’s mathematics education, while 86.4% respected Western values regarding their children’s mathematics education a moderate amount or more. Furthermore, about 7% of the general sample indicated they did not believe in Korean values at all.

Table 9

Responses to “Rate yourself on how much you believe in Korean values about mathematics education” and “Rate yourself on how much you believe in American (Western) values about mathematics education”

	Korean Values		American Values	
	n	%	N	%
None at all	3	6.8	0	0.0
A little	2	4.5	6	13.6
A moderate amount	20	45.5	24	54.5
A lot	16	36.4	11	25.0
A great deal	3	6.8	3	6.8
Total	44	100.0	44	100.0

About 32% of Korean American parents had higher expectations of their children's mathematical performance in America than they did in Korea, and 41% selected "Not Applicable" as their children did not receive formal education in Korea.

About 75% of the participants had about the same or higher expectations for their children's mathematical achievement when compared to the expectations their parents had of them. This indicated that Korean parents' value of and interest in mathematics performance passed on from one generation to another. The detailed results on their expectations can be found in Appendix F.

Survey Results of Self-Identity Acculturation Scale

The participants' responses on the self-identity acculturation scale are presented in the following tables. First, as seen in Table 10, about 59.1% of Korean American parents could speak "mostly Korean and some English," followed by 31.8% who could speak "Korean and English equally." Just under 5% of the general sample could speak "Korean only" or "mostly English and some Korean." Regarding reading and writing, more than half of the general sample (54.5% and 61.4%, respectively) indicated that they read and wrote better in Korean than in English. Just under 10% of the participants reported that they read and wrote better in English than in Korean. About twice as many parents read "equally well in Korean and English" as they wrote in those languages. Meanwhile, as twice many parents wrote "only in Korean" as they read "only in Korean." More parents preferred to use just Korean than English, as seen in Table 10. This implied that Korean American parents were more proficient and comfortable in using Korean.

Table 10

Responses to Language in Speaking, Reading, and Writing Versus Preferred Language

	Speak		Read		Write		Prefer	
	n	%	n	%	n	%	n	%
Only Korean	2	4.5	3	6.8	6	13.6	17	38.6
Mostly Korean, some English	26	59.1	24	54.4	27	61.4	15	34.1
Korean and English equally	14	31.8	13	29.5	7	15.9	9	20.5
Mostly English, some Korean	2	4.5	4	9.1	4	9.1	3	6.8
Only English	0	0.0	0	0.0	0	0.0	0	0.0
Total	44	100.0	44	100.0	44	100.0	44	100.0

The majority of the parents identified themselves as Asian, Asian American, or Korean American, at 54.5%, 11.4%, or 29.5%, respectively. When parents were asked to identify their parents' background, about 80% noted that their mothers and fathers were Asians. This indicated that participants considered their parents as first generation in the United States. A more detailed breakdown can be found in Appendix F.

When they were either age 6 and between the ages of 6 to 18, the majority of Korean American parents (79.5% and 65.9%, respectively) had friends who were largely Asian or Korean American. A very small percentage of parents, about 7%, had friends who were largely Anglo, Black, Hispanic, or other non-Asian ethnic groups. More than half of the Korean American parents selected that they preferred American music and movies over Korean music and movies. In contrast, they preferred Korean food more than American food at home or restaurants. These responses can be found in Appendix F.

About 61.4% of Korean American parents were raised mostly in Korea. Also, approximately 70% had occasional visits or communications with families in Korea. As seen in Table 11, exactly 50% of parents indicated that they currently associated with “mostly Asians and Korean Americans.” The current association to preferred association with “almost exclusively Asians and Korean Americans” decreased from 22.7% to 9.1%, respectively. The same decrease occurred for association with “mostly Asians and Korean Americans.” However, preferred association with Asian, Anglo, Black, Hispanic, or other non-Asian ethnic groups increased to about 52%, from 27% for current association with these groups. This reflected the willingness of Korean American parents to assimilate to the dominant country’s lifestyle.

Table 11

Responses to Association With Communities

	Now		Prefer	
	n	%	n	%
Almost exclusively Asians, Korean Americans	10	22.7	4	9.1
Mostly Asians, Korean Americans	22	50.0	17	38.6
About equally Asian groups and Anglo groups	10	22.7	18	40.9
Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups	1	2.3	2	4.5
Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups	1	2.3	3	6.8
Total	44	100.0	44	100.0

The participants were asked how they identified themselves, how much pride they had as Koreans, how much they valued Korean traditions, and how well they fit in Korean or American groups. Of those who participated in the survey, about 91% of the parents identified themselves as first-generation Korean in the United States. Approximately 64% of the general sample were

moderately to extremely proud of their ethnic background. While 38.6% of Korean American parents partook in some of Korean holidays and traditions, about 25% partook in nearly all of them. When the parents were asked to rate themselves, 20.9% responded “very Korean,” 31.8% responded “bicultural,” and no one rated themselves as “very Westernized.”

Table 12 shows each participant’s acculturation level, and this was done by scoring 21 items from the first part of the survey. Each question was rated on a 5-point Likert scale, where the first answer choice was scored 1 and the last answer choice was scored 5. The total value of all 21 items were summed and then divided by 21. Based on Suinn et al. (1987), raw scores from 21 to 48 indicated Asian-identified, scores from 49 to 77 indicated bicultural, and scores from 78 to 105 indicated Western-identified. In other words, acculturation levels from 1 to 2.29 reflected low acculturation with high Korean identification, levels from 2.33 to 3.67 reflected bicultural identification, and levels from 3.71 to 5 reflected high acculturation with high Western identification. Out of 44 participants, 23 were classified as being separated, 19 were classified as being integrated, and one participant was classified as assimilated. To measure the reliability of the instrument, Cronbach’s alpha was used on the SL-ASIA 21 items; the value was 0.882, indicating the survey was reliable.

The mean and median close to 2.3 indicated that most of the general sample retained their ethnic heritage identities and somewhat attempted to become integrated into American society. The data also showed that no individual was entirely assimilated in the dominant culture.

Table 12

Acculturation Level

ID		ID		ID		ID		ID	
1	2.38	11	1.62	21	2.00	31	2.67	41	2.29
2	3.33	12	3.71	22	2.10	32	2.62	42	2.33
3	2.81	13	1.95	23	1.76	33	2.10	42	2.05
4	2.52	14	2.43	24	3.33	34	2.05	44	2.00
5	2.05	15	2.00	25	2.38	35	2.95		
6	1.52	16	2.10	26	1.81	36	2.05		
7	2.33	17	2.38	27	2.62	37	3.48		
8	2.48	18	2.24	28	2.05	38	1.62		
9	1.95	19	2.33	29	2.71	39	2.10		
10	2.29	20	3.05	30	2.00	40	2.00		

Mean = 2.33, Median = 2.26, Mode = 2.05, Standard Deviation = 0.50

After analyzing each parent's acculturation level, parents were grouped by educational levels (see Appendix I). The mean of acculturation level by educational background is shown in Table 13. The sample of this study suggested that the mean of acculturation level increased with parents' level of educational attainment. In other words, the findings implied that education was associated with acculturation, such that parents with a higher educational background were more likely to adopt to the dominant society—in this case, American.

Table 13

Acculturation Level by Highest Educational Level

Highest Level of Education	Mean of Acculturation Level
High School or Equivalent	1.71
Some College	2.02
Bachelor's Degree	2.37
Master's Degree	2.46
Doctoral Degree	2.48

The one-way ANOVA technique was used to determine whether level of education was attributed to level of acculturation. The result of the one-way ANOVA test is shown in Table 14a; it was concluded that there is no significant difference in acculturation levels due to education.

However, when the participants' education was divided into three groups, as shown in Table 14b, the new one-way ANOVA test ($p < 0.05$) showed a significant difference on acculturation levels due to education (see Table 15).

Table 14a

One-Way ANOVA Test on Difference in Acculturation Between Educational Levels

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.711	4	.428	1.883	.133
Within Groups	8.861	39	.227		
Total	10.572	43			

Table 14b

New Categorization of Educational Levels

Old Educational Level	New Educational Level
High school or equivalent, Some college	Low
Bachelor's Degree	Medium
Master's Degree, Doctor's Degree	High

Table 15

One-Way ANOVA Test on Difference in Acculturation Between New Educational Levels

ANOVA					
ACCUL					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.572	2	.786	3.582	.037
Within Groups	9.000	41	.220		
Total	10.572	43			

The post-hoc test results in Table 16 revealed that the difference in acculturation was between Low and Medium Educational Levels, and Low and High Educational Levels.

Table 16

Post-Hoc Test Results on Difference in Acculturation Between New Educational Levels

(I) New_EDU	(J) New_EDU	Mean Difference (I-J)	Std. Error	Sig.
HS or Equiv. or Some College	Bachelor	-.50860*	.21299	.022
	Master or Doc	-.59731*	.23123	.013
Bachelor	HS or Equiv. or Some College	.50860*	.21299	.022
	Master or Doc	-.08871	.16020	.583
Master or Doc	HS or Equiv. or Some College	.59731*	.23123	.013
	Bachelor	.08871	.16020	.583

*The mean difference is significant at the 0.05 level.

The one-way ANOVA technique was used again to determine whether the length of residency in America attribute to the level of acculturation. The result of the one-way ANOVA

test is shown in Table 17a, it was concluded that there was no significant difference on acculturation levels due to the length of residency.

Table 17a

One-Way ANOVA Test on Difference in Acculturation Between Length of Residency in America

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.046	3	.349	1.464	.239
Within Groups	9.526	40	.238		
Total	10.572	43			

The length of residency was then redefined into two groups: short (1-9 years) vs. long (10 years or more). As shown in Table 17b, the ANOVA test revealed no significant difference on acculturation levels due to the new categorization of length of residency.

Table 17b

One-Way ANOVA Test on Difference in Acculturation Between Length of Residency (Short vs. Long) in America

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.808	1	.808	3.475	.069
Within Groups	9.764	42	.232		
Total	10.572	43			

Lastly, the one-way ANOVA test revealed no significant difference in acculturation levels due to employment status (see Table 18).

Table 18

One-Way ANOVA Test on Difference in Acculturation Between Employment Status

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.027	2	.514	2.207	.123
Within Groups	9.545	41	.233		
Total	10.572	43			

Further, participants' degree of fit into either Korean or Western culture was analyzed by acculturation level (see Table 19) using the SL-ASIA Behavioral Competencies Score system. The classification used indicated that about 66% of the participants in acculturation level 2 were "Korean Identified," signifying a high presence of conduct that empowers fit in Korean culture. About 28% of parents in acculturation level 2 were "Bicultural."

Table 19

SL-ASIA Behavioral Competencies Score by Acculturation Level

	Acculturation Level					
	2		3		4	
	n	%	n	%	n	%
N	2	6.3	0	0.0	0	0.0
K	21	65.6	3	27.3	0	0.0
B	9	28.1	5	45.4	0	0.0
W	0	0.0	3	27.3	1	100.0
Total	32	100.0	11	100.0	1	100.0

N = Neither

K = Korean Identified

B = Bicultural

W = Western Identified

After examining the SL-ASIA Self-Identity Score, participants at acculturation level 2 were defined as “Korean Self-identified,” as shown in Table 20. In other words, even though they lived in the United States, they had a “high Korean fit” and identified themselves as Korean first. The parents at acculturation level 3 were bicultural with Asian self-identified; they had “high Korean and Western fit” and identified themselves as Korean first. One participant at acculturation level 4 considered herself a Korean American, although deep down, she viewed herself as an American first.

Table 20

SL-ASIA Self-Identity Score by Acculturation Level

View of Yourself	Total		Level 2		Level 3	
	n	%	n	%	n	%
I consider myself basically Korean. Even though I live and work in America, I still view myself basically as a Korean.	23	52.3	22	68.8	1	9.1
I consider myself basically as an American. Even though I have a Korean background and characteristics, I still view myself basically as an American.	3	6.8	2	6.3	1	9.1
I consider myself as a Korean American, although deep down I always know I am a Korean.	15	34.1	8	25.0	7	63.6
I consider myself as a Korean American, although deep down, I view myself as an American first.	1	2.3	0	0.0	0	0.0
I consider myself as a Korean American. I have both Korean and American characteristics, and I view myself as a blend of both.	2	4.5	0	0.0	2	18.2
Total	44	100.0	32	100.0	11	100.0

Parents with acculturation level 3 used both English and Korean equally when communicating with their children, while parents with level 2 communicated mostly in Korean; the results are shown in Table 21. Parents with a lower acculturation level associated “almost exclusively with Asians and Korean Americans” when obtaining information about their children’s mathematics education, and parents with a higher acculturation level associated with “Asian and Anglo groups about equally.” In terms of preferred community group to associate with, both levels 2 and 3 had a higher preference for “Asian and Anglo groups equally,” but the level 2 group showed a higher difference from their current associated group.

Table 21

Responses to Communication, Association With Communities

	Acculturation Level			
	2		3	
	Mean	S.D.	Mean	S.D.
Communication with child	2.00	0.76	3.36	1.12
Association with community for educational resources in mathematics	1.47	0.51	2.45	0.69
Preferred Association with community for educational resources in mathematics	2.25	0.80	2.55	0.82

Korean American parents with acculturation level 2 used mostly Korean and some American educational resources, while level 3 parents used mostly American. Both groups of parents had a moderate number of beliefs in Korean and American values about mathematics education, as shown in Table 22.

Table 22

Responses to Educational Resources and Beliefs in Each Education System

	Acculturation Level			
	2		3	
	Mean	S.D.	Mean	S.D.
Educational resources	2.59	1.27	3.55	1.21
Belief in Korean values on mathematics education	3.31	0.93	3.27	1.01
Belief in American (Western) values on mathematics education	3.25	0.80	3.18	0.75

One of the participants stated that her parents wanted her to excel in mathematics because she was Korean and this was a norm among Koreans Americans. As shown in Table 23, both groups had slightly higher expectations since they moved to the United States. However, parents at acculturation level 3 had slightly lower expectations of their children, compared to the expectations their parents had of them.

Table 23

Responses to Expectations

	Acculturation Level			
	2		3	
	Mean	S.D.	Mean	S.D.
How much has your expectation changed concerning your child's mathematical achievement, compared to the expectation you had while in Korea?	4.41	1.52	4.27	2.41
How much has your expectation changed concerning your child's mathematical achievement, compared to the expectation your parents had of you?	3.50	1.24	2.36	1.29

Qualitative Analysis

Of the 44 participants who took the online survey, 27 indicated that they wished to participate in a qualitative study. Out of 27 participants, 17 did not respond to the emails to interview, but 10 participants replied and were interviewed. Of those who were interviewed, four participants had an acculturation level of 3 and the rest of the participants had an acculturation level of 2, as shown in Table 24. Pseudonyms were given to each interviewed participant. A number next to the pseudonym indicates the acculturation level of that participant; for example, Andy (2) means Andy's acculturation level was 2 and was classified as being separated, Chloe (3) means Chloe's acculturation level was 3 and was classified as being integrated. Most of the interviews with the Korean American parents were conducted in Korean (7 in Korean and 3 in English). Of the 44 participants, 1 male and 9 females were interviewed. Of those interviewed, 5 participants were classified as being separated and the other half was classified as integrated.

Table 24

Acculturation Levels of Interviewees

ID	Pseudonym	High School (College)	Acculturation Level
36	Andy (2)	Korea (Korea)	2.05 \approx 2
40	Blair (2)	Korea (Korea)	2.00 \approx 2
27	Chloe (3)	Korea (US)	2.62 \approx 3
28	Diana (2)	Korea (Korea)	2.05 \approx 2
21	Ellen (2)	Korea (Korea)	2.00 \approx 2
39	Felicia (2)	Korea (Korea)	2.10 \approx 2
29	Gloria (3)	US (US)	2.71 \approx 3
2	Hazel (3)	US (US)	3.33 \approx 3
17	Irene (3)	Korea (US)	2.38 \approx 3
35	Jackie (3)	US (US)	2.95 \approx 3

The interview sample was divided into two groups by their highest level of education, as shown in Table 25. Interviewees with Master's degrees were likely to be more acculturated.

Table 25

Acculturation Level, Highest Educational Level of Interviewees

ID	Pseudonym	Highest Level of Education	Acculturation Level
39	Felicia	Some College	2
17	Irene	Bachelor's Degree	3
21	Ellen	Bachelor's Degree	2
28	Diana	Bachelor's Degree	2
29	Gloria	Bachelor's Degree	3
40	Blair	Bachelor's Degree	2
<i>Mean:</i>			<i>2.17</i>
2	Hazel	Master's Degree	3
27	Chloe	Master's Degree	3
35	Jackie	Master's Degree	3
36	Andy	Master's Degree	2
<i>Mean:</i>			<i>2.75</i>

Qualitative interviews provided a framework for understanding how Korean American parents' attitudes and behaviors were modified in regards to mathematics education as a result of immigration. First, parents with less acculturation considered mathematics more seriously than integrated parents. The reasons were that mathematics was an important part of college entrance application when they were students in Korea, and they believed that high achievement in mathematics would provide more opportunities and make their children more prominent and less discriminated against as minorities in the United States. Second, many parents did not appreciate the stereotype of "Tiger Mother" labeling Asian parents, but they agreed that such rigorous parenting practices or expectations were anticipated in general because of their beliefs in the association between education and success as embedded in the culture, and their concern in the discrimination against their children. Lastly, the sample of Korean American parents showed interest in Chinese parents' childrearing, and their frame of reference with respect to their

children's mathematics learning was largely on other Korean American or Asian American children, not those of other children in Korea.

Experience as Immigrants

Each parent's immigration history and experience as immigrant parents were discussed. The most common difficulties experienced by these parents were financial burden and languages.

I had difficulties with English since it is not my first language. As a foreigner, it was challenging to study, build a career, and raise my children. [Andy (2)]

When I first came to the U.S., it was very difficult financially. My husband and I got no financial support from our families when we arrived here. My husband was the only one working and studying at the same time. Everything was unfamiliar and new to us. Having our first child and studying in a new country which we never lived before, it was just difficult and we did not know anything. Also, there were a lot of differences between Korea and the U.S. at the time. The fact that we had to adapt in many different ways was just too much burden. [Blair (2)]

My biggest challenge as an immigrant is probably my competency in English. Because of that I feel like I cannot do certain things for my children. For instance, when my children make new friends, they would want me to get close to the friends' parents as well so we could all get together. [Diana (2)]

The most difficulty is probably financial stability. Even if I make more money here [than in Korea], more payments go towards the house. [Felicia (2)]

Some parents described their immigration experience a little differently. Ellen (2) at first said, "My immigration experience so far has been satisfactory. I have been financially stable and immigration status has not been an issue, so I have not had a lot of difficulties so far," but added that language or cultural barriers always exist. She further explained her concerns about educating her children due to a language barrier.

In terms of my child's schooling, because I did not go to schools in the U.S., there have been minor difficulties. As I have spent more time here, I have gotten familiar with the system, but I always feel some pressure on linguistic competencies and have experienced struggles due to an imperfectness in English. [Ellen (2)]

A few other parents also expressed a similar concern about being unfamiliar with the U.S. school system.

Because I did not go to elementary, middle and high school in the U.S., I worried a lot as I did not know the system as well or the learning environment, and the fact that I could not help them as much as I would like to. [Andy (2)]

English is not an issue for me, sometimes English is easier and sometimes Korean is easier. Because I went to middle, high school and college in Korea, I am just more concerned that I am not familiar with the U.S. school system. There are just things I do not know. [Chloe (3)]

Felicia (2) and Irene (3) described similar experiences. Felicia (2) especially described her social environment and interactions with others.

There are a lot of Koreans in my neighborhood, I work at Korean company, and I go to Korean church, so I do not associate a lot with non-Koreans. My children translate for me when needed and I rely on them a bit, so my immigration experience has not been that difficult so far. [Felicia (2)]

She added that she was worried about the future when her children would not be able to help her. She admitted that she faced challenges in associating with others because she was “just too shy towards my children’s teachers, was a little passive, and did not participate as actively” with a presumption of her ability or thinking that she was not capable of doing anything. Both Blair (2) and Felicia (2) worried about relationships with their children due to cultural and language differences.

I studied English in Korea. I used to translate in Korea, so I never thought language would be a problem. I was depressed, but I did not want to be a parent who could not communicate with my children, so I started attending “adult school,” you know, free ESL classes, that were provided by local churches. [Blair (2)]

My Korean identity was already formed and I raised my children the way I wanted. Now that I think about it, maybe my children had more complications than I did. The culture at school and the culture at home were quite distinct that my children were practically caught in between the two. As they were growing up, they probably had issues they could not talk to me about because they might have thought I would not be able to understand. I am sure they had more concerns than I did. [Felicia (2)]

Gloria (3) had distinct remarks compared to other Korean American parents:

The area I moved to was very affluent neighborhood and there were not that many Koreans. In fact, there were not even that many Asians when I first started school there, but I was not treated in a negative, unfair way. Like everyone was just curious about who I was, where I came from, and everyone was really nice. Since my parents kind of knew that we were going to end up here, my mom really started me on my English education since I was very little so I did not really have much of a language barrier, which was a big surprise to me and to my family too. But of course, like any 1.5 generation in America, I had to do certain things that most of the kids who had parents who are not immigrants not had to do, such as dealing with bills, translating for my parents on letters and documents. It has been very interesting, and I do not think it was negative in anyway. I actually thought positive in many ways and kind of helped me to see many different aspects of life. [Gloria (3)]

Parents' Experience in Mathematics

Some parents recalled their unenthusiastic experience in mathematics when they were students either in Korea or the United States. Andy (2) commented, "I was not so good at math when I was in school, so I was a little pressured with my children's math education." Other parents recalled similar feelings. Irene (3) liked mathematics up until she started learning about differentiation and integration in 10th grade in Korea. However, each parent's experience with mathematics affected their children's learning in mathematics differently.

I did not like math that much. I just studied it because it was required in order to attend college. I liked English more. I am more linguistic and my oldest child is too, so that is why I do not push him as much in math. [Chloe (3)]

I pretty much stopped studying math in seventh grade in Korea. I did not study the basic materials that I completely lost my interest in the subject. I regret it. One day, my math teacher wrote so much course materials that he filled up the whole blackboard, and he scolded us if we did not copy them down in our notebooks. Because I was scared of that, I just copied down without really knowing what they meant. That continued for a year without understanding the materials. Since then, I lost interest and I had no idea what I was learning when I started eighth grade. I read the supplementary books, but I still had no idea, so I just memorized formulas. I could not get private tutors or go to *hagwon*, and it was a little uncomfortable to ask the teacher. It just built up, so I gave up eventually. I was okay with other subjects, but because of mathematics, my average went down. Because of my experience, I wanted to make sure that my children do well in math. I sent my children to *hagwon* and hired a math tutor for them. [Diana (2)]

When I was a student, math was a challenging and boring subject. I remember getting tutored in middle school by my older siblings' friends who were college students then. They were more concerned with my math studies than my parents. [Ellen (2)]

Felicia (2) and Gloria (3) were more enthusiastic about mathematics.

I liked math when I was a student. I liked studying math in high school. I majored in STEM field, I studied chemistry, so math was one of my favorite subjects. That is why I volunteered to participate in this study, I wanted to help. [Felicia (2)]

I do not remember having a particular interest in math in Korea, but when I came here I of course remember it being easier, and I remember it being it different because there were a lot of problem-solving focused questions, whereas in Korea most of them were arithmetic and quick calculations, so I thought it was interesting. I did well, I suppose, or okay in math when I was in school. Like I took AP Calculus AB and BC. When I went to college, my major did not really relate to math, so I did not take much, but I think I did okay. [Gloria (3)]

Felicia's (2) parents majored in Liberal Arts and did not emphasize mathematics that much.

Meanwhile, Gloria (3)'s parents had different views:

When I was in Korea, I was a really good student so my mom wanted me to go to one of those Foreign Language High School.¹ As soon as I started middle school, I was put in one of those *hagwon* program that prepared me to go to that high school. Now that I think about it, my mom was very ambitious, she wanted me to do really well, which I was able to do so. Once we moved to America, she did not have control over me because she did not know the curriculum or she did not have ways to help me out or support me or push me further as she wanted to. I kind of got lucky. [Gloria (3)]

Hazel (3) had the same acculturation level as Gloria (3), but Hazel's (3) parents did not particularly emphasize mathematics. However, her mother thought that the mathematics seemed primitive, so she sent Hazel (3) to an enrichment program, which Hazel (3) referred to as "Asian style mathematics." She explained that the whole point of the program was just being able to calculate faster and cover as many materials as possible at a faster pace.

¹ Specialized high school in Korea for which admissions are very competitive.

Jackie's (3) father was a chemist who always emphasized that she should be good at mathematics, which would be very important if she wanted to study in science, although that was actually not her particular interest at that time.

Like any other Korean parents, they wanted me to consider medicine as a career. I mean they did not pressure, but my dad would kind of sneak it in there every now and then and say, "You know, it is really important that you know and be comfortable with this mathematical knowledge so that you have more options." He did say that. I remember hearing that growing up. [Jackie (3)]

In conclusion, whether the participants were classified as separated or integrated, their experience in mathematics was influenced by their own parents or Korean education system. Further, the participants' experience impacted their parenting cognition in mathematics.

Abacus

Hazel (3) learned how to use an abacus when she was a student and commented on it by comparing it to Singapore mathematics:

...it was kind of similar to the Singapore math, it was this sort of different approach to math. Because math is so intimidating to people and especially children, I think that's why Singapore math is such a good tool. I'm thinking an abacus is also a good tool to come at math from a different way, to understand it and appreciate it. I think, without even realizing, it helps you do math. An abacus in the class wasn't just to use as machines, it was helping you to think about math and mental math and this type of stuff. Inevitably you end up being a master calculator, but also its ways of thinking of math and numbers and so I thought that was such a great experience.

Hazel had such a positive experience that she sent her children to learn how to use an abacus as well.

At first, you learn all the comprehensive ways of using the abacus and then you use the abacus to do all sorts of these types of functions. Then the biggest part which I wanted to get for my kids was just really strengthening their mental math. You really understand that, you visualize things and then that just helps you in general. I just felt like I got a better relationship with numbers in general. That's where I wanted to start, so I had my children to do abacus, it is basically a chain nationwide, it's called ALOHA. It is all over the country.

When the researcher said abacus was not taught at schools in Korea anymore, Hazel agreed: “Certainly like a dying breed—now they are sort of reviving it, they sort of are catching on again. Several people—I don’t know how well does nationwide, but I know there’s definitely a presence of students in these classes.” Hazel appreciated that abacus class aided her children in ways that they did not necessarily realize about mathematics. She lastly brought up a story of her child’s classmate who could do square roots in her head and that “she is just full of genius and she attributes all the stuff to the abacus class.

Korean Cultural Beliefs of Mathematics Practice

Parents had various opinions about how mathematics should be studied and the skill sets that should be mastered. For example, Blair (2) pointed out that being able to do arithmetic quickly and accurately without calculators is important, so a lot of practice and repetition are required. Felicia (2) also commented on such practice that her children had, and because she believed that repetition and a lot of practice problems in mathematics are important, she had her children work on several mathematics workbooks.

There was a Korean church in my neighborhood and they offered math classes during summer since a lot of parents worked. It was like a summer school that lasted four to five weeks for low cost. I remember that my children had workbooks that had a lot of repetitive practice problems, and they went every summer probably up until the end of elementary school and they found it very dull. They found the repetition especially tedious. [Felicia (2)]

Jackie (3) described her own experience in which her parents emphasized a lot of repetition:

...just doing the same thing over and over, so it sort of ingrained in you. Personally I felt like it made you forget a lot once the retention is gone. Especially relevant to my subject, I was a biology major and you just memorize and memorize, and repeat and repeat. It really worked well for the subject, but then if I did not pursue it further and if I did not become a teacher myself, then I think it would have escaped from my head very easily. [Jackie (3)]

She still thought that repetition is necessary when one first tries to learn certain materials in mathematics, but she advised her children to teach their friends who struggle or try to apply further for a longer retention. However, Diana (2) was opposed, saying, “I definitely think that understanding the concepts is more important than memorization.”

In Korea, multiplication tables are memorized with rhythm, like a song, and this is called *Kukudan*. It is taught at the elementary school level, so everyone is very familiar with it. Parents were asked to reflect on their experience of teaching *kukudan* to their children.

Because I did not want my children to fall behind, I definitely encouraged my children to start studying beforehand. For example, I made my children memorize *kukudan* before learning multiplications at school since in Korean culture, we all have to prepare and study for the next chapter materials beforehand. Then one day my child said to me ‘Dad, I only have to up to 5-*dan* [multiples of 5]. I cannot do 6-*dan* today because my teacher told us not to do 6-*dan*.’ So I wondered why schools in the U.S. prohibit students from studying beforehand. They did 3-*dan*, 4-*dan*, 5-*dan*, one day at a time, so in that sense I felt like it was the difference in culture and learning process. [Andy (2)]

I definitely had my children memorize *kukudan* at home. [Felicia (2)]

I learned *kukudan*. I told my children somewhat [to memorize *kukudan*]. I told them when I first introduced it, third grade or something, I said, “This is how I learned in Korean” and I sang the song and they just thought it was really funny. It was a learning thing and they were just like “Haha, there is a song about it,” and then we tried to sing it when we were driving around. I thought it was really silly and they thought so as well, we just laughed about it. It didn’t really work like I wanted it to be. I mean they eventually got the concept, which is good. But the *kukudan* song was not the reason she got it. [Gloria (3)]

Hazel (3), a second-generation Korean American, did not have direct experience with *kukudan*:

I’ve heard of it, yes. My mom used to [talk about it]—I don’t know about necessarily the calculation thing, but I think definitely the very fundamental foundation is just different. It starts with a different philosophy. I think that way of thinking is certainly better instead of mental math. Having understood from that perspective and sort of taking that track of understanding math in this different way, I think definitely, it helps people a lot more. I didn’t necessarily take it to the point where I really excelled at math, so well, that you can become—natural to it but I think the idea now for us to sort of revamp of how math is taught is definitely a better approach for sure. [Hazel (3)]

Parents agreed that high educational values in Korean are sustained in the United States.

Gloria (3) and Hazel (3) had similar viewpoints.

Absolutely. Absolutely. That is in your blood. Koreans come here and they bring their competitiveness with them. I think that is part of the reason why Koreans were able to really be successful as immigrants when they came here. Yeah, my parents wanted me to do well in school. I think, of course all Korean parents, all Asian parents may I say, felt that way. [Gloria (3)]

I think it's just sort of a rat race of life. Education is important for a lot of people in general, but certainly for a lot of immigrants...I think Koreans, they just fit into this stereotype sort of seamlessly. This way of thinking and this mindset, it doesn't surprise me at all because growing up, our parents were not like what we call tiger moms now, they weren't so intense about this. But certainly education was important, excelling was important as well. It doesn't surprise me that as my kids get older, I don't think you sense that much in elementary school, but I think when you're in a competitive school district, certainly you will feel it in middle school, which is what I've been doing more and more. [Hazel (3)]

Hazel (3) noted that her background as a Korean affected how she viewed education as well as how her children should view their academics seriously and consider them a priority. Though she said she did not have them focus particularly on mathematics, she wanted them to have a very comprehensive grip on the subject.

Jackie (3) stated that the importance of mathematical studies and its value among Koreans will not go away for a long time. However, second- or third-generation Korean Americans gradually start to understand the importance of other subjects as they experience life in the United States, so that they try to instill in their children the importance of diverse abilities. Jackie believed that "now there are a lot of Koreans who are turning away from just exclusively math-related careers."

In conclusion, Korean American parents in this study considered mathematics studies essential regardless of their acculturation levels. Further, when studying mathematics, separated

parents (parents with lower acculturation level) emphasized Korean methods more often to their American born children than integrated parents.

Beliefs about *Sun Hang Hak Seub* and *Hagwon*

Sun hang hak seub, translated as prerequisite learning or pre-learning, is very popular in Korea. The term refers to learning that a student prepares and learns in advance with materials specified in a national, municipal, provincial, or school curriculum. Early childhood education or acceleration is also considered *sun hang hak seub*. Usually because of a concern over the increasing difficulty of mathematics in the upper grades, parents in Korea enforce *sun hang hak seub*. Because of excessive *sun hang hak seub*, the Korean government passed the Special Act on the Promotion of Normalization of Public Education and the Regulation of *sun hang* Education and the Prohibition of the *sun hang* Education Act, formally known as Promotion of Normalization of Public Education Law in 2014.

All parents at acculturation levels 2 and 3 received *sun hang hak seub* in mathematics when they were students in either Korea or the United States. The immigrant parents at acculturation level 2 believed more in *sun hang hak seub* than the parents at level 3, and they supported the practice so much that they themselves taught their children mathematics at home using the mathematical resources they found on their own.

Regardless of acculturation levels, almost all parents had tried *sun hang hak seub* in mathematics with their children at home. However, the reasons for doing so varied. For example, Andy (2) said that his wife knew the importance of mathematics very early on and their child did fourth grade mathematics when he was in first grade. Both Felicia (2) and Irene (3) explained it was a norm in Korean society.

Koreans definitely value *sun hang hak seub* as a priority, and if I were in Korea I probably would have done *sun hang hak seub* as well with my children. In Korea,

English and math take a great portion of overall grades, so when in the education system where grades are the most important, distinguishing and assessing the mathematical levels and abilities of students make people more anxious about math studies. Of course, with a higher score, a student can go to a better college. And if a student does well in math, that student is automatically perceived as a good student. It is not so much about the interest in the subject, but how math holds more power as a tool of grades or assessment. That is why Korean parents focus more on math education or do *sun hang hak seub*. [Felicia (2)]

Some parents mentioned their confidence in the subject as a reason for teaching their children themselves.

The reason I did *sun hang hak seub* with my children in math was I was good and confident in it. A subject like science required high-level vocabularies. I did it with a textbook. [Blair (2)]

The math content itself that Korean parents studied when they were students is not that different from the math content that their children study, unlike social studies or science, so it is easier for parents like me who are not that highly educated to have children to study. Because of that, I think of it as one of many efforts Korean American parents make for their children. [Ellen (2)]

Ellen (2) shared her views on why such practice is so popular even in the United States among Korean American parents. She believed that parents consider mathematics is a subject in which children can get higher scores or get ahead faster, even with small efforts, than when parents do nothing at all. Also, when studying mathematics, Ellen stated, “You can see the improvement more easily than other subjects when you put your children to study.” She admitted that she had doubts about *sun hang hak seub* in the past.

My view on the *sun hang hae seub* has changed more positively. More *sun hang hak seub* could be beneficial and skipping a level in mathematics is not a bad thing if it is helpful for that student. I definitely have leaned more towards favoring *sun hang hak seub* or skipping grades. As my child gets older, I have realized they are not necessarily worthless. If a child has even a little bit of potential in higher level, I would definitely pursue. [Ellen (2)]

However, Ellen repeatedly underscored that under the assumption parents do not pressure and children do not experience struggles, *sun hang hak seub* is reasonable. She regretted that her

child did not start *sun hang hake seub* earlier and actually planned to have her daughter study mathematics for about a month during the summer before going into high school. Even though she had a positive view of this practice, she reflected that she sometimes pushed her child without knowing the real purpose of doing so.

Including my child, when Americans have comprehensible reasons or purposes on skipping grade levels, more studying becomes meaningful. In Korea, most of the time, students are pressured to do better than everyone else or be in higher learning levels without pondering their individual purposes or goals; studying is just meaningless. To put it simply, the question of “why do *sun hang hak seub*” is not asked at an individual level in Korean culture other than to be ahead of other people. [Ellen (2)]

Chloe (3) opined how far ahead in time *sun hang hak seub* should take place. She said:

Sun hang hak seub is only necessary for a next chapter or something. I do not think I agree with elementary or middle school students learning the materials in high school. My perspective is that simply skimming through the materials during the summer break is enough.

Other parents like Felicia (2) and Gloria (3) had opposing opinions about *sun hang hak seub*:

I think it was the school in the U.S. atmosphere made it feel like that *sun hang hak seub* seemed not ideal because if students did *sun hang hak seub*, they lose interest in learning especially at school. Well, at least for my children, because of that I did not push in *sun hang hak seub* that much. I just left my children as they were, without *sun hang hak seub* in math. [Felicia (2)]

I do not think so. What is the point? You already know it. I mean you may understand it better because you are getting a repeat, but if you already understood it on the first try, you will get bored in class. I think it has positive and negative. The positive would be a deeper understanding. The negative would be disengagement from the class material. [Gloria (3)]

Hazel (3) confirmed that she observed a slow increase of *sun hang hak seub* among other children in her children’s school district. She stated, “My husband and I have pretty much our philosophy is if you want to excel, you have them to get in an Excel track, but I don’t know about going beyond.”

When Gloria (3) was asked if she would have her children tested to skip to the next grade level of mathematics, she said, “If they showed interest and were good at mathematics, I would, but I would not do it without their consent.” She agreed with other parents that the ultimate goal of everything basically leads to postsecondary education, although she did not agree with the extra time and energy spent just to make children stand out, especially beyond AP classes.

Diana (2) shared her experience of *sun hang hak seub* with her child. She believed that it did help him a little bit when he was in lower grades, but as he started 6th grade, she thought it was not as effective and he did not do as well as he used to. She supported *sun hang hak seub* because it would be easier, saved time, and was helpful later in high school for her child.

Irene (3) regretted that her child missed a chance to skip a grade level in mathematics. She reasoned, “If I had another chance, I would definitely have my child to skip, like pre-algebra so she can finish math earlier. Then in junior or senior year, she can focus on other subjects or other extracurricular activities more.”

Along with *sun hang hak seub*, *hagwon*, the afterschool supplementary private institute, is very common in Korea. Kumon is a similar program in North America, but *hagwon* is increasingly attractive now in the United States, especially in neighborhoods with a high Korean American population.

Gloria (3) initially thought that Kumon would help her children in doing arithmetic more accurately and quickly, but she stated it did not. Ellen (2) had never sent her child to *hagwon* before, but hired a mathematics tutor who came once a week for an hour. She believed that she did not force her children to do tutoring, and having a tutor come on a regular basis was better than parents trying to teach their children. She explained that her husband was interested in Korean language studies, English language studies, and mathematics, also known as *kuk-young-*

su in Korea; he watched Khan Academy mathematics and taught their child in 7th grade almost every day, quite steadily. However, she added, “My child later told me though that the method she was taught by my husband was confusing, and she did not have similar issues with a tutor. My husband graduated in Korea, so perhaps that is why.” Ellen (2) explained the main reason she hired a tutor was that she wanted her children to learn how to divide up the assigned work over the week and study independently after the tutoring session. She then added her uncertainty about the real purpose of private education:

On the other hand, I cannot deny that perhaps I hired a mathematics tutor because everyone else does it, but maybe I do not have accurate information. I guess it could be because everyone around me says that math is important, I sometimes go along with it. [Ellen (2)]

Other parents did not experience or share similar views on *hagwon*:

I sent him *hagwon* in the neighborhood when he entered the middle school. However, what they taught was not aligned with the materials taught at school. I was not happy with the idea. It could have been my child’s ability. I think he did not have a full understanding of concepts. Just because someone did many math problems, it does not mean that a concept is fully understood. At *hagwon*, if my child said he got it even though he did not, they just moved on. [Chloe (3)]

Felicia (2) visited *hagwon* in her neighborhood when her children started high school because she knew other classes were harder to be on top of the materials. She described how the majority of teachers of mathematics *hagwon* graduated from high schools and colleges in Korea or received Bachelor’s degrees from one of the most prestigious colleges in the United States.

Diana (2), on the other hand, regretted not sending her middle child to *hagwon* because he had trouble with geometry and lost interest in mathematics, unlike her oldest child.

Gloria (3) had never sent her children to *hagwon*, but she would consider *hagwon* or hiring a tutor if her children reached a level of not understanding the concepts, if children just did not understand even with extra help at school, or if the school instruction was not enough. She

thought that tutoring was more cost effective than *hagwon*. In general, parents' experience with *hagwon* in the United States was unsatisfactory due to differences in mathematics practice between the children's schools and *hagwon*, and so they preferred a tutor to support their children's mathematics achievement.

The parents who were less acculturated were more experienced and familiar with *hagwon* and with *kukudan* than Westernized Korean American parents, and they were more likely to have children memorize the multiplication tables at an early age.

General Beliefs about Mathematics

During the interviews, some of the parents shared their views on mathematics:

Math is a study about numbers, but the value of mathematical studies becomes more significant when utilized and applied in other fields of studies. Just finding numerical answers is not the end of solving problems. [Felicia (2)]

Gloria (3) believed that innate ability was a primary factor in determining students' performance in mathematics. Then she considered supplemental aspects like training, tutoring, and "drilling" to be secondary factors. Felicia (2) also believed that innate ability affects mathematical skills to a certain extent. She provided an example of how Koreans believe that prenatal education is important and some of her friends actually solved mathematics problems while they were pregnant. On the other hand, Diana (2), Irene (3), and Hazel (3) had similar views on training and effort.

I think being smart has nothing to do with doing well in math. I have continuously told my child that it is the effort that matters, but he does not think that way. He thinks that a person has to be smart first and then he would have high academic achievement. [Diana (2)]

I think the mathematical capacity depends on effort and training up until high school. After high school, I think innate capacity determines mathematical ability. [Irene (3)]

I think math skill is nurtured. Obviously there has to be some baseline to some level of intelligence, but after that, it is sort of people who talk about the philosophy about innate talent and versus how well, how hard you work, and how much you practice. Math is

particularly unique in that it's really based on principles and then you have those principles and employ. I think you just do a lot of it, you can get efficient at it. [Hazel (3)]

Parental Support at Home

Many participants helped with their children's mathematical learning, were well aware of their children's weakness in doing mathematics, and shared the approach they used. For example, Jackie (3) tried to incorporate surroundings that were more relatable as her child had a little difficulty with word problems. She explained that once the wording was deciphered, it was much easier for her child to do the calculation. The challenge for her child was to understand the mathematical concept behind the problems, not the actual mathematical skills. She recalled, "We tried to do it together, I tried to be as imaginative as possible, relating it to her own experience, or changing the wordings of the word problems so that it fit her situation."

Chloe (3) had her children practicing arithmetic during summer break when they were in elementary school. She admitted that helping her children has been difficult since they started Algebra I and felt it was much easier when she studied mathematics in Korea because she had workbooks and just had to solve problems.

Irene (3) shared her experience of teaching her children long division:

...she got so many answers wrong on her test and made me doubt if she even understood the concept. I did not feel the necessity of helping her until then because I thought she got all the basic concepts from before. While I was teaching her, I could see that she could not keep up with just school lessons, so I decided to teach her myself. I thought if I were going to teach her anyway, I told myself: Why should I wait until she learns from school? So I ended up teaching materials beforehand. In sixth grade, I taught her in advance to prepare for math competitions. I feel that the school hours are a lot shorter here than Korea. The main reason I taught my child was that the school could not fulfill what my child was lacking in. [Irene (3)]

Gloria (3) helped her children using workbooks but later sent them to Kumon. She also shared her approach when teaching them mathematics:

I would ask them to look over the questions they got wrong and then ask them to redo it. If they got it wrong because of a mistake, that is fine. But then if they are not getting a concept, and if that is the reason why they are getting a set of problems wrong, then we need to analyze which part of the concept they are missing and then we try to go over that. [Gloria (3)]

With different concepts and different parts of mathematics, Gloria (3) believed it was difficult for her to teach sometimes because she knew certain drilling helped when they first got to subtraction or multiplication, but geometry could not be just engrained.

...when my kids were going through like arithmetic, when they were grade school, I tried to get them those worksheets, and then I sent my kids to Kumon. It was an easy fix, they give you weekly homework, they look over the worksheets, you don't have to. I am not sure if that was the most effective, you know, maybe it was not a fix. I just thought kids went there and did it, but I don't think it improved their performance one way or the other. [Gloria (3)]

Felicia (2) focused more on her children's mathematics education because she did not have as much information on other subjects; moreover, the topics in mathematics were pretty much set and she was already familiar with them.

In general, parents helped their children with mathematics studies, but reasons were different by acculturation levels. Korean American parents who were acculturated with separation participated and considered their children's mathematics education more seriously than other subjects because of their schooling in Korean and familiarity with the subject.

Sources of Mathematics Education

Each parent had different routes for obtaining information about mathematics education. For example:

I get information from my friends who are also parents, or the website called MissyUSA. Including me, a lot of Korean mothers rely on that website, for information like math tracking. Immigrant mothers have trouble especially with their first child. It is difficult for us to see the big picture, like getting into high school. [Chloe (3)]

Diana (2) got school-related information from a tutor and did not communicate with other Korean parents as much. Similarly, Ellen (2) received information from a tutor in addition to the school website and acquaintances. She further explained that the school website described mathematics classes that could be taken at different grade levels, so she could get the big picture and then consult with a tutor to obtain an idea about what her child needed to do in high school and what she could do to support further her child. Diana disclosed that she would first search online and read everything in Korean, so it would be easier for her to understand any information on the school website or other resources available in English. Ellen (2) finally added, “What I hear from other people is their personal opinions most of the time, so I only take into account what is applicable to my child.”

Irene (3) got workbooks from a bookstore, where the owner was Korean and sold workbooks that were not available in popular bookstores, like Barnes and Noble, although probably on the internet. When she chose the workbooks, she prioritized them by how well the mathematical concepts were explained. Felicia (2) also purchased mathematics books which teachers used and specifically looked for books with a lot of practice problems. She had unique ways of attaining information, such as newspapers, *hagwon*, PTA meetings, and acquaintances from church.

There is a column once a week focused on education in Korean newspaper. I referenced that Korean newspaper the most, and it was a lot better than not knowing anything at all, but they sometimes overstated certain information and it turned out not to be. Secondly, I got information regarding college application or SAT from *hagwon* during a consultation with *hagwon* teachers or when they held information sessions. Lastly, acquaintances whose children were recently admitted to college or people from church shared their experiences with me. [Felicia (2)]

Felicia remarked, “The public school system is very well organized in my neighborhood anyway so I am quite thankful because it has been very supportive.”

Jackie (3) was a former teacher, so she had direct connections to some of the resources; her former colleagues recommended websites and resources they found effective in teaching.

Lastly, Gloria (3) commented on how informative first-generation Korean American mothers can be:

Korean mothers these days, whether they are here for only a couple of years because of their husbands' employment, or second-generation mothers, well, especially the first-generation mothers, they got sea of information. They are very ahead of their games, but it all depends on what you choose to do. Even from Korea, you can get all the information about American school system, what we do, or any schools around the area; *yuhagwons*² have a lot of information on that. [Gloria (3)]

Felicia (2) brought many Korean workbooks for her children when she moved from Korea to the United States. The books had only practice problems with a good deal of repetition but with different numbers. She remembered that her children disliked them, but she strongly believed in a certain period of learning, repetition is necessary, especially in early childhood.

Jackie (3) used board games that dealt with simple mathematics skills like counting, addition, and subtraction when her children were 3 or 4 years old. She recalled:

They didn't even know that they were studying math. They are both girls, so they were kind of interested in counting and getting these pretty stuff, their possession. In turn, it kind of made it seem like they were just hoarding different pretty stuff, but it was actually involving a lot of simple math skills.

Association Between Korean American Parents

The general sample of parents did not show patterns of interpersonal behaviors with other Korean American parents, indicating a low interaction between Korean American parents. Chloe (3) described that she got information from a few Korean mothers, but it was not possible for her to find all the information she desired. Felicia (2) rather expressed a disappointment in the lack of connections between parents.

² Education agencies that help Korean international students with visa and school applications.

Despite the high number of Korean parents in the neighborhood, there was not involvement or association between Korean American parents. Nobody really invited me to participate in school functions. Like in Korea, other parents would say, “I am volunteering in this. Let’s do this together.” I guess because everyone immigrated at different times, the idea of doing things together is a bit unlike. We are all aware of each other and say hi to each other, so if one or two stepped in, then many of could have participated together. [Felicia (2)]

Hazel (3) was born in the United States, a second-generation Korean American. From her interaction with other first- or 1.5-generation Korean American parents, she shared the differences between education systems:

...when they talked about the general education system, it was still pretty different than how things were here...when I was in grad school and I would meet—Koreans who were there to study just for the grad program. It fit all the stereotypes of how they viewed education here and how things worked after they had graduated from Korean universities, and then coming here, they did stuff maybe differently...it was sort of consistent with what I would imagine their education system and how it runs. [Hazel (3)]

Jackie (3) explained there was much competition within the Korean or Asian communities as well. She said, “I have seen plenty of moms like torture their children because they want their child to be known as the smartest among the Korean community.” Then she compared them to the Indian community, saying they were “really strong in math, so once you sort of surpass the Korean community as the smartest, then now you are competing against bigger Asian community, like Chinese or Indian.”

Felicia (2) did not have active interaction with other Korean American parents, but she described that “Korean American mothers from my children’s elementary school tried very, very hard to get their children into this GT program because they can receive step-by-step education once they are in the program.”

Comparison Between Korean and American Mathematics Education

During the qualitative interviews, participants were asked to further describe their experience in Korean mathematics education and their input in their children's mathematics education in the United States. A few parents compared different learning environments:

When I was in Korea, each student did not get any individual attention and teachers were just concerned about not falling behind in the curriculum. In that sense, I really liked the learning environment in the Western culture and was satisfied that my children had better classroom setting. [Andy (2)]

In terms of learning environment, Gloria (3) pointed out that group work was not as common in Korea. She favored engaging and interactive learning environment that would improve her children's social skills. Felicia (2) did not oppose group work, but she was concerned about how far it would reach out to each student's learning.

The downside is that the level of interest of each student is so different. For example, in a group of five, three students would not be as interested and the remaining two would do most work. The purpose of group work is respectable, but depending on students' participations, the aim of group work may not be met. [Felicia (2)]

Diana (2) explained the challenges she faced as immigrant parents in terms of cost of education:

For my children, the U.S. provides a better learning environment than Korea. At the same time, I sometimes feel it is quite challenging here as well and Korea's education system is better organized. It is true that the spending on private tutoring or supplementary education program is a lot higher in Korea. Overall, I think it is better for children and harder for parents in the U.S., like tutoring is expensive and it has been more difficult to find a good tutor. The atmosphere here is more relaxed and children have more freedom, but Korean children are more obedient and study what they are told. I feel though as if there is no guarantee that they would be successful, and I have spent more money here, but I did not see the desired results. [Diana (2)]

Participants also compared the materials and the methods. Blair (2) preferred the "Korean way of teaching," while she believed that students were treated with more respect in the United States. She reasoned that cultural differences made her believe that the American education

system took all kinds of excuses to extreme. She also pointed out that in Korea, students always studied or memorized as they were told, but students in the United States had far too many excuses.

For example, *kukudan* is simply something you memorize. If you were told to memorize from 1-*dan* to 5-*dan*, you just do in Korea. There are no excuses. If you do not, they beat you. Perhaps the beating is not as much these days. American teachers take way too easy on their students, and even if students do not memorize multiplication tables, teachers do not take it any further or seriously. In my opinion, *kukudan* is just purely memorization and it is easier that way; it should not take a lot of time in explanation or deep understanding at the level when children first learn. Maybe the idea of *kukudan* should take thirty minutes and take an hour to memorize it. [Blair (2)]

Diana (2) remembered needing to memorize a lot of formulas and using them to solve mathematics problems. She compared how her child was required to provide explanations for his answers. She added, “Because of that, I think more parents have math tutors to help their children. At first, I was not happy with it [requiring explanations] because his grade went down, but I think it will be helpful for my child in the long run with in depth thinking.”

Diana (2) stated, “I have seen Korean students who recently moved to the U.S. and do well without a lot of troubles; it made me think that rote learning is perhaps effective. Maybe the way they teach in Korea is not that bad.” Irene (3), on the other hand, compared Korean and American mathematics education with respect to private education:

American parents around me, they hire tutors when their children fall behind, like in Chemistry or Spanish. There are also parents who hire tutors even though their children do not fall behind in school, and usually the subjects are math or English, and it is usually Asian parents. But I also have seen non-Asian parents who hire math tutor for their children just to get ahead. My child is in math club and I know that the students in the club also receive tutoring to prepare for mathematics competitions. [Irene (3)]

Ellen (2) commented on the difference in assessments: “Getting a correct answer was more important in my days while sufficiently showing steps to an answer is more important in the U.S.” She presumed, however, that Korea’s assessment system might have changed more

like the U.S. system in recent years. She also compared the two cultures based on *sun hang hak seub*:

From what I observe, most American students do not have particular reasons for skipping grade levels or doing *sun hang hak seub*, do not invest more time than necessary to skip grade levels, and do not put a lot of meaning in extra studying just to get ahead. For instance, they would question “Why should I study extra just to skip grades?” I think that is where the difference in cultural values exists. They seem to think homework completion is enough and satisfactory. [Ellen (2)]

Jackie (3) called Korea’s teaching method very didactic in that students did not get to share their thoughts, but just copied down what was on the board and memorized what was given. She thought the scores on the TIMSS indicated the effectiveness of that method to a certain degree because very good scores might have been produced. For example, she claimed:

...the whole education system is shifting to this Common Core Standards where you have to know certain common core concepts in order to do well, and that is very Eastern culture-driven education. But they are suffering from whole imaginative and creative side of education. What I am trying to say is that, yes, it might produce really high scores and it might look good on papers, but it is the application part and retention part that suffer. I don’t think it lasts long, the positive effect of it. [Jackie (3)]

Jackie pointed out that Koreans who were taught in a traditional way generally performed well academically, but she was concerned that Korean American students would “stumble a little bit just because they were not trained to look bigger picture or broader once they had to go further” in higher levels of education.

Irene (3) believed that high scores in international studies were due to early exposure:

...students in Asian countries learn more complicated materials at younger age so their scores are probably higher in those international studies, not necessarily because they are better. I think even the society itself, at least in Korean society, they have a high standard for the students. The education system, for example, all Korean high school students have to study calculus whereas it is optional for American students. [Irene (3)]

Gloria (3) recalled *sun hang hak seub* or *hagwon* being popular in Korea. She added, “I went to *hagwon* and when I was in sixth grade I was already studying middle school material. It was the norm, like that is what everyone was doing.”

Hazel (3) lived in Korea for a very brief period of time, but she observed that the Korean education system was structurally inflexible and did not have much variance in teaching methods. She added, “That falls in line with there’s not too much variance with how curriculum is taught here, but I think that things get a bit wider, the breadth of material seems to be a little bit wider sort of with where it starts and ends, versus what I experienced in Korea.” She further described how her children’s school district just changed from the Houghton Mifflin standards and how issues arose from that:

The way the math has always been taught, they changed it to Math in Focus which is based on Singapore math. I know that’s catching a lot of people’s attention throughout the country. It was a very big thing here when it happened. When they first switched over the curriculum which was about four, five years ago, it was a lot of having to educate all the teachers on how the system works. Educators who’ve been teaching were quite—essentially, we were mapped in a whole new format...but it was also really foreign to most. Even some other Asians who were raised in Asia and they didn’t happen to learn that. I thought that was really interesting and surprising because I kind of only thought it was a much more pervasive way to learn math. I was actually surprised that people who came from China or Taiwan or Korea, they actually didn’t learn that way. [Hazel (3)]

Hazel expressed that she was really shocked, almost ironically, because these first-generation Asians were very resistant to Math in Focus, Singapore math, and found it counterintuitive. She believed it was much like Common Core in building a foundation of mathematics concepts for a much broader, long-term range of how to use mathematics. She indicated concerns “because when people do not understand what they are doing, there is a lot of emotion,” and she observed much resistance to mathematics in general, little progress, and difficulties appreciating when students learn using Singapore Math.

Felicia (2) was the only participant who compared textbooks. In Korea, there are only a few different mathematics textbooks to choose from, and students have to learn everything in the textbook from beginning to end. Her children's school uses e-books during high school senior years, but there used to be a thick textbook from which they studied only selected chapters. Felicia remarked that the importance of mathematics textbooks definitely seemed different in each country. She thought, "As far as the math education is concerned in the U.S. now, there are so many problems with it. It's perplexing why people hold on to a system which clearly does not do well for us, but as far as math goes as a country, we're doing very poorly as an entity." Felicia (2) further compared mathematics teachers' attitudes towards mathematics:

Mathematics teachers here really love mathematics and numbers, so they teach mathematics, but they do not have high interest or encouragement for students who are not interested in mathematics. I do not mean it in a negative way, but they seemed to not have any pressure on leading children to like mathematics and study more. Because of that, children do not seem to get dragged on with mathematics and the classroom atmosphere seemed more relaxed compared to Korea. [Felicia (2)]

Chloe (3) actually mentioned a contrasting aspect of her child's mathematics learning. She believed there seems to be much fast-paced memorization without much explanation and added, "Koreans admire the education system here, but I feel like it is not as well organized."

When Gloria (3) was a student in the United States, she was in the Integrated Mathematics System, which she described as "the new innovative way of combining algebra, geometry, and later to the level of trig, and it was a new approach and I went through that as a guinea pig at my school district." She compared it to the system in which her children are currently enrolled:

...it [my kid's materials] is more into the conventional like algebra is algebra, geometry is geometry, and they do a little bit of statistics. They go unit by unit, it is more traditional than what I went through, which is fine. I still do like the approach of a problem-solving focused method, rather than just drilling them on getting the answers because I think that is a lot more realistic and life applicable. I cannot tell for the other

person's experience, but I remember the school district I was in first adopted this program they thought of it really positive, they went through that. Even a few years after I graduated, they decided to switch back the curricula. I really don't see much difference in approach as much as the concepts because I know all these concepts are introduced, but at different levels and different ways. I don't have a preference; as long as all the concepts are introduced, I don't think method is a big issue. [Gloria (3)]

Challenges in Mathematics Education

While many parents tried to teach their children at home, they experienced similar challenges. Andy (2) commented on different ways of solving mathematics problems in Korea and the United States, and this resulted in some conflicts between his wife and children, which led him to believe that *sun hang hak seub* was not always beneficial. Blair (2) described how she had to change her methods of helping from her first to her second child.

There were some cultural differences between me and my children. That means our thinking process, mentalities, et cetera. Even when we were facing the same problems, the way we solve or think them were different. This meant that I had to make efforts to understand them because they were young. It felt like being a newborn baby, even though I was already a grown-up. That was the greatest challenge. I studied education both in Korea and the U.S. I taught math in a very Korean way to my first child and a very American way to my second child. When I was teaching my first child in Korean way, we had so many conflicts that I realized I might destroy the relationship and tear him down. After that I completely changed with my second child and they are now completely the opposite. [Blair (2)]

Felicia (2) described the methods that her children's *hagwon* teachers used to teach:

They taught the methods the way they learned in Korea meanwhile my children learned differently at school, so obviously when my children used the methods they learned from *hagwon*, they were not given full credits on school exams, even though the answers were correct. You know those math teachers who want you to use only the methods that they taught you? It was like that. After a month, my child told me that she was able to get an answer faster if she used the methods she learned at *hagwon*, but not necessarily the methods that were preferred at school. Because of that, my children stopped going to *hagwon*. I think it is because the teachers went to high school in Korea. It was only in math that I experienced differences like that, unlike English. [Felicia (2)]

Felicia (2) was able to help her children with mathematics until middle school. Because her children had difficulties in algebra, she helped them using the ways she learned in Korea. She

recalled, “It was easy for me so I wondered why they had difficulties. I scolded them when I was teaching them. Yes, I have episodes. I definitely remember my children crying while solving math problems.” The ways she taught created some conflicts because they could not understand each other since they used terms differently, in either Korean or English, and her children apparently experienced similar challenges with *hagwon*. When Felicia’s (2) children started high school, she could not continue to help because she was not familiar with much of the mathematical vocabularies. Ellen (2) experienced the similar difficulties when she helped her children with mathematics studies.

Chloe (3) taught her children at home because she felt *hagwon* did not provide enough practicing. However, she admitted how teaching the children herself made the relationship with them worse. Diana (2) bought workbooks that were recommended by the tutor. She commented that it was easier to discipline them when they were younger, and as they got older, they did not study as much on their own, so she tended to rely on the tutor. Interestingly, she not only had faced challenges with the mathematics itself, but with having to explain to her children about stereotypes. Her children were born in the United States and they reckoned that Korean students were supposed to be good at mathematics. She then added:

However, they think they are not Koreans and therefore they are not good at it. Especially any Korean students who had studied in Korea, they are good at mathematics. I told my children that the reason newly arrived Korean students are good at mathematics, because they go to *hagwon* and they do *sun hang hak seub* so my children think that. [Diana (2)]

In conclusion, parental involvement in mathematics education and their educational values were being reconstructed as they were put in situations that challenged their beliefs in parenting, and they ultimately became more open to changes and negotiations, while their children felt pressure to do well in mathematics just because they were Koreans.

Reasons Behind High Interest in Mathematics

Many parents connected mathematical achievement with more opportunities in careers and stable income. They desired their children to work in STEM fields and, hence, more focus on studying mathematics resulted. In addition, they explained that Korean American parents focus more on mathematics education in the United States because of the grading system in Korea where mathematics and English are weighted more than other subjects. Even though the children were situated in a different education system, parents retained the standards that are followed in Korea.

I believe math is the fundamental to everything we learn. If anyone does well in math, then that person will do well in other subjects too. I think being good in math helps in other science classes in high school. Also, a student cannot take AP classes if they are not good at math. I think math is beneficial, probably not all the time in everyday life, but in terms of the way think can be improved. In order to have a comfortable life, having a steady career is important. Then I tell my children that receiving good grades is crucial, like in computer science or engineering, or go to medical or law school. I think being financially stable is important. [Diana (2)]

Diana (2) mentioned, however, that her children did not view the connection between financial stability and academic achievement as she did, and they believed they would have a stable lifestyle as long as they did what they wanted.

When I was in Korea, math was weighted predominantly in college application, so math was taken very seriously. Korea is a small country and the competition is very high, so in order to go to a good college, get a good job, and then have a happy marriage, everyone automatically accepted that math was the most important subject. The reason for high achievement in math was not about interest in math or something. For everyone, it was just about getting good grades. There is a tendency to stress math among Korean parents before finding out children's interest first or without specific motives. Also, STEM professionals have been becoming quite popular, so I think I emphasize math because I have been following the trend. [Ellen (2)]

Ellen (2) further explained that she had her children focus on mathematics more than on any other subjects because it would be the most important factor in high school or college applications. If they fell behind, she believed it would be very difficult for her children to do

what they want later because solid preparation in mathematical skills was very important in her opinion. She was satisfied that her child's linguistic skills were in the top 5%, but as the child's mathematical skills were not in the top 5%, she paid more attention to mathematics studies.

Felicia (2) had worries for her daughters as female minorities. She admitted that she told her children about the importance of mathematics education all the time because of different ethnic backgrounds.

I tell my children that they simply could not be in the same level as others [non-Korean Americans] and they need to acknowledge the fact. Even between friends, you notice different treatments [to each other]. Also, the group of friends have changed as my children got older. There is always this invisible line. I tell them that as an Asian female in the U.S., there is a glass ceiling. I am not rich that I cannot support them financially, so I always feel the pressure myself, my children feel it, and I feel it when I have to tell them this stuff.

I had an expectation that my children to study more mathematics in college and get jobs related to math because they are Asian females. I simply thought that they would have more opportunities as Asian females in the field of math and engineering. I recommended my children to major in science or engineering where math is essential. There are people who attend college because they just simply want more education, but the most cases are to find professional employment more easily after graduating. Therefore, I told them if they majored in STEM fields, it would be more beneficial for them when applying for jobs. They considered the advice, and actually chose something similar to STEM. [Felicia (2)]

Gloria (3) reasoned that both the social environment and the immigrant community values affect the focus on mathematical achievement:

It is the environment we grew up in and we were raised. Of course, the Korean community here is so success-driven, right? You have to be successful. Whether it would be you make a lot of money, you go to prestigious college, or you get a multimillion job, so I think that is the main reason why. [Gloria (3)]

Hazel (3) believed that some children had a facility and inclination and just love mathematics; otherwise, the parents were really the ones dictating initially and guiding them towards that path. Although she understood mathematics was a fundamental foundation for

many, Hazel rather reasoned with her observation by stating, “Maybe these parents saw STEM as the strongest way to have the most amazing opportunities.”

Diana (2) had similar input about being minorities in the United States:

Because I grew up in Korea and it is in the culture, I always tell my children that they have to do well in school. They talk back and question me why academic achievement is so important since education is not about everything. Then I tell them since they are not Americans, they may not have as many opportunities as other non-Asians. If there is something they can do well in, I do not have a problem. However, if there is not, education should be the priority for them. My children certainly do not understand me. For example, I tell them, “If there was you and your friend, both of you had same qualification, they will probably pick your friend because you are Korean. Therefore, in order to overcome that discrimination, you have to be really good at something, either it is academics or not. Other things can be more difficult than studying so you should at least study really hard to have more opportunities. If you are good at math, you can major in math and have more opportunities.” My children do not agree with me, though. [Diana (2)]

Jackie (3) actually did not understand why Korean parents in the United States were so strict and focused so much on education, especially mathematics, until she became a parent herself:

...times are changing and there are Korean Americans who are exceling and making influence in the society. However, we are still minorities, and for us to catch up to the competition with the rest of the world, I think knowledge is actually really powerful, even though it sounds really cheesy. For them to be comfortable and have more options, I think education is very critical and pivotal in that process. Math sort of sets us apart, not everyone, but because most of us were trained by the school system in Korea which still emphasize math, as a population we kind of have an advantage and we have that special intelligence when it comes to those subjects. Again, not for everyone though. Compared to other nationalities...because we are such a small country and to compete with bigger and stronger countries, unfortunately that is one of the only ways we could really make difference. I actually have experienced that growing up. Ultimately, when you get to the top, they are more favorable towards Caucasians or people of their kind rather than minorities. [Jackie (3)]

Gloria (3) did not believe that mathematics would provide more opportunities like other parents. As she explained, “I actually think reading and writing is more important because they

are life skills. Math, you can use a calculator most of the time...for general majority of people, more efforts and money to improve mathematics skills will not open more doors for you.”

Hazel (3), who was a second-generation Korean American, actually had a similar view to more “less Westernized” parents:

I think it provides more practical opportunity, so I guess, yes, ultimately. I think also coincidentally, like a happy coincidence for people, math provides more lucrative opportunities. It covers a lot of things that parents would want for their children. [Hazel (3)]

Tiger Mother

Korean American mothers had various thoughts and stances on the idea of “Tiger Mother.” While Blair (2) considered herself a “Tiger Mother,” Chloe (3) did not, although she added, “My child probably would not agree with me as I demand a lot of things. If he knew what Amy Chua did to her daughters, maybe he would think differently.” Andy, who was the only male participant of the study, shared:

From what I witnessed between my wife, who is definitely a typical tiger mother, and my son, it took a long time for them to overcome conflicts. Especially during my son’s teenage years, there were a lot of conflicts. As a Korean father, I definitely have characteristics of what they say about “tiger mother” too. I do not think it is a bad thing. [Andy (2)]

Hazel (3) expressed, “This rigorous type of parenting might seem to help children in a way, but Amy Chua was extreme to the point of unhealthy.” However, she acknowledged that nobody really knew how hard to push children sometimes. She provided an example of an interview with an athlete whom she saw who praised his mom with how she pushed him harder every time he was tired; he attributed all of his success to her reinforcement and was grateful for it.

Some interviewees seemed to ponder such parenting practices because of their children’s limitations. For example, Diana (2) said, “If my children met the expectations and did as well as

those girls from the book [*Battle Hymn of the Tiger Mother*], I would probably do the same as her [Amy Chua]. However, because my children are not the same, my expectation had been lower, so I just encouraged them and became satisfied when they to do their best.” Hazel (3) stated a similar sentiment:

On the same sense on the flip side of the coin, it could be someone who could have had the same treatment but then cracks under the pressure, who resented and rebelled and basically just fell apart.... I know just within my children, my oldest is a quintessential oldest first-born, we had to push him pretty hard and try to get him to really aim high and push for high goals. I think I can use that to extent with my middle, but—and she has fun for now, but I wouldn’t be surprised if later she becomes more resistant to that kind of pushing. [Hazel (3)]

Even though many parents did not appreciate the stereotype of “Tiger Mother” labeling Asian parents, they did not have negative views of it. Ellen (2), for example, did not agree with the idea of being a “Tiger Mother” because children would not be happy, but she still believed that giving too much freedom was not good either. Felicia (2) believed “Tiger Mother”-like behaviors need to be compromised:

I think it is necessary to some extent. If both a mother and children can handle, it should be done. Mothers’ capabilities in doing so are separate from children’s, so how much a child can accept is important. If parents and children can find a middle ground, I think it would be very beneficial for children as it would guide them. However, if the idea of “Tiger Mothers” becomes too hot, parents who cannot provide as much or children who cannot receive such support or are not even aware of such opportunities may feel isolated or inferior. [Felicia (2)]

The stereotype of “Tiger Mother” is an Asian mother, or Asian mother is a “Tiger Mother.” I am an Asian mother, but I am not a “Tiger Mother.” I know there are a lot of “Tiger Mothers” in Korean mothers, but I am not one of them. I particularly define myself as quite the opposite. Around my school district and mothers around in this town, I have seen a plenty of “Tiger Mothers,” who are White, Indians, Africans, or whatnot. I hate this stereotype. [Gloria (3)]

Most Korean immigrant parents listed common reasons for pushing their children in mathematics education. For instance, Andy (2) said, “In order to obtain more opportunities and more options in life as minorities living in the U.S., it is a right thing to do as parents who have

lived and experienced more to mentor and lead their children to the right path; so being a ‘Tiger Mother’ or ‘[Tiger] Father’ is a positive behavior.”

Blair (2) and Diana (2) brought up the same theme about Korean parents’ beliefs in the association between education and success as embedded in the culture. Especially because Korean Americans are considered minorities in the United States, immigrant parents are more assertive and success-driven simply to give their children a better life.

If I raised my children the same way like the rest of parents in U.S., they would not be able to survive. What I am trying to say is that in Asian culture, existence of “Tiger Mother” is not a surprise. They have to be Tiger Mothers because of societal belief and culture [on success] in Korea or China. On the other hand, you do not have to in the U.S. [Blair (2)]

Korean parents are strict because as Asians, minorities in the American society, we need to be better. Some people say that it has changed, but I think Korean culture still has aspirations for professional careers. For instance, even my husband thinks that life would be easier for my children if they became doctors, lawyers, et cetera, and that they have to be successful in academics, especially in English and math. My children think otherwise that they would live well with anything they like doing, but we tell them that the reality is not quite the same. [Diana (2)]

Irene (3) thought that Korean or Asian parents have such high standards and pressure for their children to do well because the parents have already accomplished so much. She added:

At least in my neighborhood, all the Korean parents are successful and very academic, so I think high academic achievement is more obvious and it simply is not acceptable for their kids to do worse than they themselves did. It is their experience that stimulated high expectations from their children. [Irene (3)]

Andy (2) feared that his children would be discriminated against or not be able to get along with their classmates because of their ethnicity when they attended a school with no Asian students. Diana (2) also explained why Korean American parents tended to retain Korean cultural values about mathematics education and parenting practice:

The mainstream American family’s parenting practice is probably good if my children decided to continue to live in the U.S. However, their appearances are different from the mainstream families. Therefore, if I raised my children the same as the mainstream

parents, I am afraid their appearances [ethnicity] becoming their weakness and not able to overcome the discrimination so I think I continue to raise my children in “Korean ways.” With Korean cultural values, educational values and knowing that we are minorities, I constantly worry for my children that they will not do as well if I raise them in “American ways” so I continue to pressure and remind them in Korean ways. [Diana (2)]

Ellen (2) also retained Korean cultural values just like Korean parents living in Korea. She argued that most Americans received their education in the United States, so they approach it in their cultural way, unlike her. She therefore raised her children in Korean ways, where communication style and lifestyle are different from the dominant society, and she described herself as “very Korean even in the U.S.”

Unlike other participants, Jackie (3) described the evolution of “Tiger Mother” characteristics:

...they have sort of changed overall. When I was growing up, “Tiger Mothers” literally fit that stereotype, but then I think times are changing. Now they are somewhat little more laid back. I think “Tiger Mothers” of our generation is different from “Tiger Mothers” now. They do not pressure their children as much as before. There are so many different options available, even for Korean Americans in general. It sort of broadens the scope for the Tiger Mothers as well, not just for the kids, but for the parents as well. [Jackie (3)]

Lastly, Jackie (3) thought it was unfortunate, but many Korean parents feel their children have to fit the role of being good at mathematics. Korean American parents may be a little relaxed on other subjects like English, literature, or social studies, but she said, “When it comes to math and science, they are like ‘you have to be in AP, you have to be in like those college-level courses,’ you know it just seems right.”

Expectations of Korean American Parents

Chloe (3) pointed out that many Korean parents like to share with other Korean parents how many levels or how far their children have completed academically. She then stated, “I think some Korean mothers like to boast about their children’s academic achievement, especially

in math. Some even say that children will be considered as failures if they did not go to specialized schools.”

Jackie (3) also heard the expression that Korean American parents “wear children’s achievement like designer bags,” and indicated that “If you have a smart child who is known in the whole school or whole neighborhood, Koreans know that parents are behind these children.” She highlighted, “Anyone who spent enough time in Korea would notice the culture that children’s academic achievement is a status of parents, such as when a child excels, it gives that upper hand for the parents’ status.” Jackie (3) lastly mentioned:

I think even though it is disappearing a little bit, I think it is still there. Because a lot of parents are still direct products of their parents. If you become like second or third generations, I think that kind of subsides a little, but at least for me and my friends, my generation, it is definitely prominent. [Jackie (3)]

For Diana (2), high academic achievement was still a priority, and successful children meant “going to medical school or prestigious schools, or getting a good job, and these are accompanied by hard work.” She was not satisfied with her children’s current mathematical achievement, in that they easily received A’s when they were young, but it did not mean they were good at mathematics. She thought that good mathematics grades do not necessarily imply being mathematically talented. Diana (2) and her husband expected to find a teacher who could teach the foundation of mathematical concepts well enough to lead eventually to deeper learning rather than being satisfied with good grades. She felt that her children’s school system did not meet this expectation and it was a challenge to find a teacher to assist.

Even if my children do not major in mathematics, I think it is necessary for them to take advanced mathematics classes in high school. By taking advanced mathematics classes, it is helpful for other classes and gives a student confidence. I believe that anyone who did more mathematics than me has a broaden mindset. I’ll be happy if they at least major in mathematics and I think that may give them more opportunities. [Diana (2)]

Jackie (3) shared a similar experience that when she was growing up, successful children were viewed as those who were studious, Ivy League students, who had high academic achievement. However, her perception had changed after she became a parent herself. She no longer associated success with academic achievement, but rather with the happiness and joy that come from utilizing one's talent.

Felicia (2) did not have very high expectations of her children's mathematics achievement. However, she thought that distinctions made about students' academic abilities by the system were important here in the United States, as they were in Korea, so she had her children take AP mathematics classes as would any other Korean American parents, without fully understanding the educational system.

Gloria (3) did not have high expectations like Felicia (2). She did not expect her children to take advanced mathematics classes in high school:

I want them to do just do decent, meaning they have to...like really my expectation is like if they get B plus or higher, I am good. Oh, actually B plus...okay, maybe just A's. I don't know. A minus is okay for me. See what I mean? Maybe I am little too naïve. They are getting decent performance out of their curricular, and they still have some excitement and enjoyment in learning, that is where I want them to be. [Gloria (3)]

Hazel (3) considered mathematics of great importance and "a big skill to have to be particularly proficient more than your average person," although she indicated she would not necessarily push her children beyond the excel track in high school. She was satisfied with her children's current performance in mathematics, but certainly hoped they would continue to excel beyond the average and have real strength in the field.

Both Chloe (3) and Irene (3) expected their children to go to prestigious schools and they commented that postsecondary education was a necessity, not an option. However, Chloe (3) was opposed to stressing her children at an early age about studying because she did not want her

children to lose their motivation to study later in college. She acknowledged that she still made her children study more at home because she wanted to make sure they did not fall behind. She also commented that she would send her child to a high school with special programs or affiliations with nearby colleges if his interest in mathematics grew.

Ellen (2) had a different expectation of her children when they studied mathematics:

...not just about getting good grades. I wish my child to know her limit, but not to settle for her current abilities. People tend to make choices that are comfortable for them and choices that may not require a lot of effort. I do not want my child to do that. When she goes to college, has a career, or is married, I want her to be able to conquer her limit at each moment to move up to the next level in her life. I want her to learn that life skill while she studies, it is not about going to prestigious colleges. After knowing her limit, I want her to practice and learn how to challenge herself and increase that limit a little by little each time from her education. I think everyone has different starting point, but the importance is how each person invests in getting over their individual limit. [Ellen (2)]

Jackie (3) considered expectations to be parental pressure. She believed that she did not pressure her children because she understood what pressure could do to a child:

I tell them, "If you have any difficulties or challenges, you can always come to me and I will try to help you as best as I can. But you don't have to excel at it." I think if they really feel the need to want to catch up and if I can't really provide that [help], I will provide an option of having a remedial class or Kumon or learning center or something to help them out, if they wish. The choices are optimally up to them. I think it is sort of similar to how my dad and my mom sort of handled the school situation. [Jackie (3)]

Jackie was hesitant about her children taking advanced mathematics class or participating in mathematics competitions. She felt that those can turn children away from the subject altogether because competitions become too fierce or children feel too pressured to be the best. She added, "Students these days have so much input and stimuli, and they have so much more stressful things than when we were growing up." In the intense environment, when they get close to the top but fail, Jackie suspected it could be devastating for their self-esteem or self-worth.

On the other hand, Ellen (2) said she would certainly want her child to take AP mathematics classes. She specified that she would talk her child into taking advanced

mathematics classes, even if the child did not want to or will not major in mathematics in college. Ellen's (2) reasons for doing so were her child did not know exactly what she wanted to do in the future at the time this interview took place, and "it is the best for my child to be ready and provide as much as I can, so she can later have many options to choose from."

Interest in Other Ethnicities

This sample of Korean American parents showed interest in Chinese parents' childrearing. Chloe (3) believed that their rigorous parenting practice was a national characteristic and deeply embedded in the culture. As she compared:

Chinese mothers are a lot more extreme than Korean mothers. Korean mothers sure want their children to do well and care a lot, but Chinese start at very early age. I know a Chinese mom who made her daughter practice piano an hour every day since kindergarten. [Chloe (3)]

Blair (2), who identified herself as a "Tiger Mother," lived in China for 3 years. She clarified that it is simply Asian culture that would not fade away, even when living in a different country. She stressed that the amount of studying Korean students do was nothing compared to what Chinese students did:

They study a lot. A lot. I thought I studied a lot in my life, but I had never seen anybody studying that much. They are like machines. They did not have their personal time. I even told them not to study so much that they are going to die. I shared with them how students studied in Korea and U.S. and they did not believe it. They said they would not be able to survive if they studied like Koreans or Americans. [Blair (2)]

Felicia (2) shared her observations of Chinese and East Indian parents in her neighborhood:

There are so many passionate Chinese and Indian parents in my neighborhood, it is unbelievable. I heard that there is a special *hagwon* run by Chinese and this *hagwon* has a special program and courses in several levels which prepare students to be admitted to those prestigious colleges. For them, it is about which *hagwon* they need to attend, not school necessarily. Indian parents make their children to memorize up to multiples of twelve. There is a famous specialized public high school in Science in my neighborhood. It is probably one of the highest in the country and you have to apply to attend [Thomas Jefferson High School for Science and Technology]. About more than half of student population is probably Asians and half of Asian student population is probably Indians.

Technology industry has become quite big in this area so there has been an increase in Indian population. I guess they think high academic achievement guarantee comfortable life or high social standing, so they push their children just as much. [Felicia (2)]

Post-Interview Questionnaire

After the semi-structured interviews, each participant was asked to fill out a questionnaire on his or her attitudes toward mathematics and its achievement (see Appendices D and E for actual questionnaire). Cronbach's alpha value was 0.870, ensuring the reliability of the questionnaire. A general sample of Korean American parents strongly believed that mathematics was a very worthwhile and necessary subject. Parents at acculturation level 2 agreed slightly more with this statement than parents at level 3.

Acculturation level 2 participants agreed strongly that mathematics was the most important subject that everyone should study, and high school mathematics courses would be very helpful, regardless of what their children decided to major in. Meanwhile, level 3 participants felt neutral about these two statements. Parents with acculturation level 2 indicated that they were less satisfied with their children's mathematics grades.

Level 2 parents had higher expectations for how their children should take as many mathematics courses as they can during the school years and should be on top of the mathematics class. They also believed more strongly than level 3 parents that studying mathematics would help their children with problem solving in other areas, and having a strong mathematics background could help their children in their professional careers.

Both level 2 and level 3 parents felt enthusiastic about their children's mathematics education and disagreed with the statement, "I am only pleased when my child gets A in mathematics class." Level 2 parents were more willing than level 3 parents to hire a tutor when

their children needed help in mathematics studies, and they were sterner and more assertive about mathematics studies and achievement, compared with other subjects.

Individual responses were organized by acculturation levels, as shown in Tables 26 and 27.

Table 26

Acculturation Level 2 Participants' Answers on Post-Interview Questionnaire

	Questions											
Level	1	2	3	4	5	6	7	8	9	10	11	12
Andy (2)	5	5	4	3	3	2	3	2	4	1	4	4
Blair (2)	5	5	5	3	4	2	5	3	4	1	4	3
Diana (2)	5	5	5	4	5	5	5	5	5	4	5	5
Ellen (2)	3	4	4	4	2	4	4	3	2	4	4	4
Felicia (2)	5	4	5	2	5	5	5	5	3	2	3	4
Irene (3)	5	5	5	2	5	4	5	5	4	2	4	4
Mean	4.7	4.7	4.7	3.0	4.0	3.7	4.5	3.8	3.7	2.3	4.0	4.0

Table 27

Acculturation Level 3 Participants Answers on Post-Interview Questionnaire

	Questions											
Level	1	2	3	4	5	6	7	8	9	10	11	12
Chloe (3)	4	4	3	5	4	4	3	3	4	4	3	4
Gloria (3)	4	2	2	1	2	2	4	2	3	2	2	2
Hazel (3)	5	4	4	2	4	4	4	4	4	4	4	2
Jackie (3)	5	2	3	2	2	1	4	4	4	1	3	2
Mean	4.5	3.0	3.0	2.5	3.0	2.8	3.8	3.3	3.8	2.8	3.0	2.5

Answers were then organized by the participants' educational background, as shown in Table 28 and Table 29. In comparison to Lareau's (2002) working-class and poor parents (discussed in Chapter II), Korean American parents wished their children to pursue higher-level

mathematical studies to give them protection from discrimination rather than for their children to acquire mathematical talents and skills per se. This finding was evident on the answers to the post-interview question #8 among parents with some college or Bachelor's degrees because they believed more strongly that mathematics could enhance their children's professional paths and hence promote less prejudicial treatment.

Table 28

Participants With Master's Degree Answers on Post-Interview Questionnaire

	Questions											
Level	1	2	3	4	5	6	7	8	9	10	11	12
Chloe (3)	4	4	3	5	4	4	3	3	4	4	3	4
Hazel (3)	5	4	4	2	4	4	4	4	4	4	4	2
Andy (2)	5	5	4	3	3	2	3	2	4	1	4	4
Jackie (3)	5	2	3	2	2	1	4	4	4	1	3	2
Mean	4.8	3.8	3.5	3	3.3	2.8	3.5	3.3	4	2.5	3.5	3

Table 29

Participants With Some College or Bachelor's Degree Answers on Post-Interview Questionnaire

	Questions											
Level	1	2	3	4	5	6	7	8	9	10	11	12
Blair (2)	5	5	5	3	4	2	5	3	4	1	4	3
Diana (2)	5	5	5	4	5	5	5	5	5	4	5	5
Ellen (2)	3	4	4	4	2	4	4	3	2	4	4	4
Felicia (2)	5	4	5	2	5	5	5	5	3	2	3	4
Gloria (3)	4	2	2	1	2	2	4	2	3	2	2	2
Irene (3)	5	5	5	2	5	4	5	5	4	2	4	4
Mean	4.5	4.2	4.3	2.7	3.8	3.7	4.7	3.8	3.5	2.5	3.7	3.7

Other Significant Commentaries

Blair (2)

Blair gave the example of Hong Kong, which is similar to Korea in that high competition has created an atmosphere where everything works for survival. She added that, therefore, the “Tiger Mother” is not cruel. From an American point of view, it might look harsh or unreasonable, but from an Asian point of view, it was very obvious, and this is a clear cultural difference.

Blair also believed that the United States was not the center of the world anymore. If one continued to live just in the United States, thinking “American ways” might be enough. She claimed that “with the way of thinking we have in the U.S., we cannot survive out in the world,” and it really depended on where an individual lived. She reasoned that whether one lives in Asia or America, one needs a mindset that fits in with a corresponding society and culture. Blair shared a story of her mother who was not as educated:

...because she did not have opportunities to learn that it left her with a lot of resentment so she sent her children to the best schools. When I actually went to one of those best schools [in Korea], my classmates were children of actors, Congress, or other famous people. I was a top student, so it was fine between me and my friends, but when it came to parents’ involvement, I had nothing. Since then, I wanted to be a good and capable parent, so I majored in education in college. However, after I arrived in the U.S. and had a child, I realized that I was not as good as my mother. At least she was able to communicate, but I could not even communicate properly [with my children]. I felt powerless; my lifetime dream was being a good mother, but I felt a lack of ability. That was my reality.

Chloe (3)

Chloe implied that she would hire a tutor if she was to raise her children in Korea just because everyone did so in Korea. She believed that her children needed to be in the top 10% in high school in order to attend a good college. She explained that Korean mothers who went to high school in New York City and then went to the State University of New York (SUNY) had

friends who went to specialized high schools and attended SUNY as well. Thus, Korean American mothers would not send their children to specialized high schools since only a few students at the top will be admitted to prestigious, private colleges, and the rest will end up going to CUNY or SUNY.

Chloe actually considered moving her children to a different school because they were not performing well in mathematics. She criticized that her children would not have a choice but to take AP classes because they were already on the advanced track, and she thought perhaps this would not be necessary if they were not going to major in mathematics.

Diana (2)

Diana believed that she made sacrifices for her children because she moved to a good school district, worked hard, and tried to support her children financially. In return, she asked them to study harder for the effort that she put in. She confessed, “My children tell me that they study so much, they do not necessarily need to be in a good school district or tutoring, and they do not want me and my husband to make sacrifices if it is such a burden for us.” By contrast, Irene’s idea of sacrifice was different from Diana’s. Because she did not work, she spent most of her time taking care of her children and considered it her full-time job. It was important for her to do that until her children graduated from high school.

Diana said she used to relate children’s academic achievement with immigrant parents’ success. Her thoughts, however, have changed recently because as a parent, she just had to do her best to give support, so her children could make their own choices. She explained that her children’s declining abilities and potential were part of the reasons for changing her opinions.

Ellen (2)

Ellen believed that insisting on academic studies without purpose or meaning was unnecessary. She thought having some common ground that parents and children agreed on was ideal, and she described how she and her child actually set a goal together, such as investing more time in studying before starting high school since she was not in a high-level class yet.

Ellen had a full-time job which she explained was not “giving up my career because of my child.” She admitted, though, that she felt sorry she did not give her child full attention. She strongly believed that parents’ happiness came first, and she would not necessarily consider moving to a better school district, even though it was desirable.

Ellen opined that there was way too much competition in Korea and the majority of students sometimes did not know why they had to do well academically, or they sometimes could not pursue what they truly desired to do.

Felicia (2)

Felicia compared mathematical learning to practicing the piano. She believed that if a child gave up in repetition of practice, he or she will not be able to master the necessary skills to play the piano and move on to the next level. She added, “Especially at the beginning level, in any types of learning, repetition is required.” She said that she pushed the child too hard on the piano and the child gave it up.

Gloria (3)

Gloria despised the misconception that all Asians were supposedly good at mathematics. As she explained:

...there [are] plenty of Caucasians who are entering their kids into AIME, AMC, Singapore mathematics, mathematics competitions, and Olympiads. If you go into those competitions, the majority of these are Asian kids, but not all of them. What I am thinking is that it is not because other ethnicities or races are not incapable, but they just

choose not to compete or to participate in these events. We just think mathematics is like epitome of intelligence, we invest on it and we throw ourselves in competitions, and we study ahead and that is why we are exceling but that does not guarantee that we are innately good at mathematics.

She stressed that she was sometimes concerned about her children's performance in mathematics as well but tried to stay on her core values because once she "began to falter, then that is when all the tutoring starts, and once it begins, it will be impossible to quit."

Gloria was willing to move to a better school district with good reason, such as if her child really struggled or had social problems. However, she explained:

I would not do anything that is out of my reach because then I do not think I am setting the right example for my kids. So, if I were to do everything like cut down my hours on my work, give up on my job, or move to another area just because of their education, then they will get a concept as "My education and I are the priority of my parents' life" and that is not true. I do not want to do that, but if it is needed within a reason like my child is having a learning difficulty but the school is not able to provide.

Gloria admitted that as a parent, she was always under pressure to be a role model for her children.

Hazel (3)

Hazel recalled that when she was a student, attending less elite schools meant not as many opportunities would be available. Regarding "Tiger Mother," she believed there existed a difference in philosophy of how far and hard to push children and where to set the bar. She also added, "It all depends on the person themselves; some people are just more receptive to the challenge, who actually thrive on being challenged that way."

Regarding rigorous parenting practices, Hazel opined that "Really pushing your children to overcome when they want to give up and teach persistence, helping them keep persisting, and pushing to challenges and not give up" was important. She believed that "it comes down to how

one quantifies and every parent would have a different principle behind it.” She also shared her experience on her piano practice:

I was certainly at a point in middle school when I wanted to stop, I was very resistant. My mom and I would try to argue for months, maybe years, but then once I got past that, I was so grateful that she didn’t let me give up and I found the joy in the music. I got over that and essentially it helped and so—certainly I don’t think every outcome would be like that when it comes to that kind of resistance.

Hazel compared different generations of parents in which there were different types of sacrifice and, in particular, she compared her own sacrifice to her parents’ sacrifice:

The first-generation parents always talk about how the current generation is sort of the ungrateful generation. It was meant our generation that doesn’t do as well as our parents’ generation in some instances. There are these articles about how ungrateful millennials are. I think to some extent it is too much cuddling over the years. You just don’t feel that kind of hunger like our parents did. How can you really recreate that kind of hunger that our parents had to come and sacrifice? It’s certainly not on that level. But I think parents in general, all parents sacrifice their energy, their time and their dedication to really staying engaged with their kids and making sure that they’re very present and very engaged with what’s going on to make sure they’re helping them keep on top of stuff.

Irene (3)

Irene pointed out, “It is true that repetition and practice are more underlined because getting correct answers are more important. Test scores are so crucial in Korea so they make you do as many problems as possible because the more various types of problems, you see the better.” Irene had similar experience regarding playing the piano:

When my child was young, I taught her piano for about three years. I remember the lesson ended with her crying, not because it was like an hour long. Even if it was like half an hour, she said she could not do it so what can I do. I did not push her further.

Jackie (3)

Jackie’s parents did not force her afterschool remedial mathematics classes, but she recalled her friends attending such classes after school:

My friends growing up were really pressured by their parents, and they just went and so turned off by math just in general, or school in general for that matter. They are doing something completely different, anything but math related, so I feel that too much pressure could turn children away or discouraged them. Because my parents did not pressure me as much, so it actually helped me not to be so daunted by math. So just consequently, my husband, who had similar experience as me, and I do not pressure our children. We only just encourage math studies when our children seem to be interested in it.

Many more Korean Americans or Asian Americans are more vocal now compared to 10 years ago. As Jackie clarified:

...when I was in school, Koreans were always so quiet, such model students. We were kind of discouraged from vocalizing our opinions and that was also very common at home. My friends had very minimal or if not no talk, no conversation with parents. These parents pressured and told them just to go to school or *hagwon*, but then they never took time to ask “Do you even like this subject? What interests you?” I think they did not try to cultivate what they were good at. My parents’ effort to talk to us was a very positive thing growing up. Naturally I do the same. Compared to my friends, I do a lot of talking so I know what is going on with my children’s social life. I feel I know mostly what is going on with their lives. Because of that, I’m hoping that like I was, if there was something at school that they did not like or disinterest them, they would be comfortable enough to tell me. I think that really helps in that it sort of takes away the pressure and encourages them to use their talent and interests.

Chapter V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

With 48% increase of Asian immigrants in the United States since 1990 (Dao, Teten, & Nguyen, 2010), a child's mathematics achievement in a culturally diverse learning environment is important. Parental involvement greatly impacts children's mathematics learning, especially those with ethnic minority status living in different cultural backgrounds.

The purpose of this study was to explore the sociocultural view of Korean American parents on mathematics education and development as they follow transition processes of their own. This study sought to determine the parents' shared values, beliefs, customs, and ways of life in their mathematics education practices.

The research employed mixed methods that utilized both quantitative and qualitative data. The quantitative survey was developed using the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA) (Suinn et al., 1992). The semi-structured interview was developed to expand on the findings of the quantitative data and investigate further the participants' responses from the online survey.

Korean American parents who had middle or high school children in the United States were invited to participate in this research study. A total of 44 Korean American parents participated in the online survey. Ten of the 44 parents were selected to participate in the second part of the research, semi-structured interviews. After the researcher collected and analyzed the quantitative data, she conducted semi-structured interviews with the 10 participants. The aim of

doing interviews was to gain evidence about Korean American parents' expectations of, opinions about, and participation in their children's learning of mathematics while they acculturated to the dominant society. This study particularly elucidated how the Korean cultural background contributed to parent involvement in mathematics education in the United States. The interviews took place during the months of December 2017 and January 2018, and they were recorded and transcribed. The participants were then asked to complete a post-interview questionnaire, which was developed using the instrument Attitudes Toward Mathematics Inventory (ATMI) by Tapia and Marsh (2004). The analysis of the questionnaire provided more evidence to support the results derived from the interviews and the online survey and to answer the research questions.

Conclusions

The ecological theory of human development and the life-course theory provided a framework for examining the interactions between a person's development and both immediate and remote environments. Since there is no single specific optimal approach for studying human development throughout the life span, different entry points can be used that range from culture to the human organism (Elder & Shanahan, 2007). Thus, the ecology of human development was appropriate to apply to families from diverse ethnicities and backgrounds. It was also helpful for understanding the complex structures of development for ethnic parents and their children.

The result of this study supported the principle of ecological systems that human development is the resultant process of multidimensional environments and their interrelationships. Figure 4 below describes this relationship.

The development of Korean American parents' values and expectations of mathematical learning was influenced by both traditional and dominant cultures as well as the interactions of both cultures. Further, while the participants in this study shared the same nonnormative

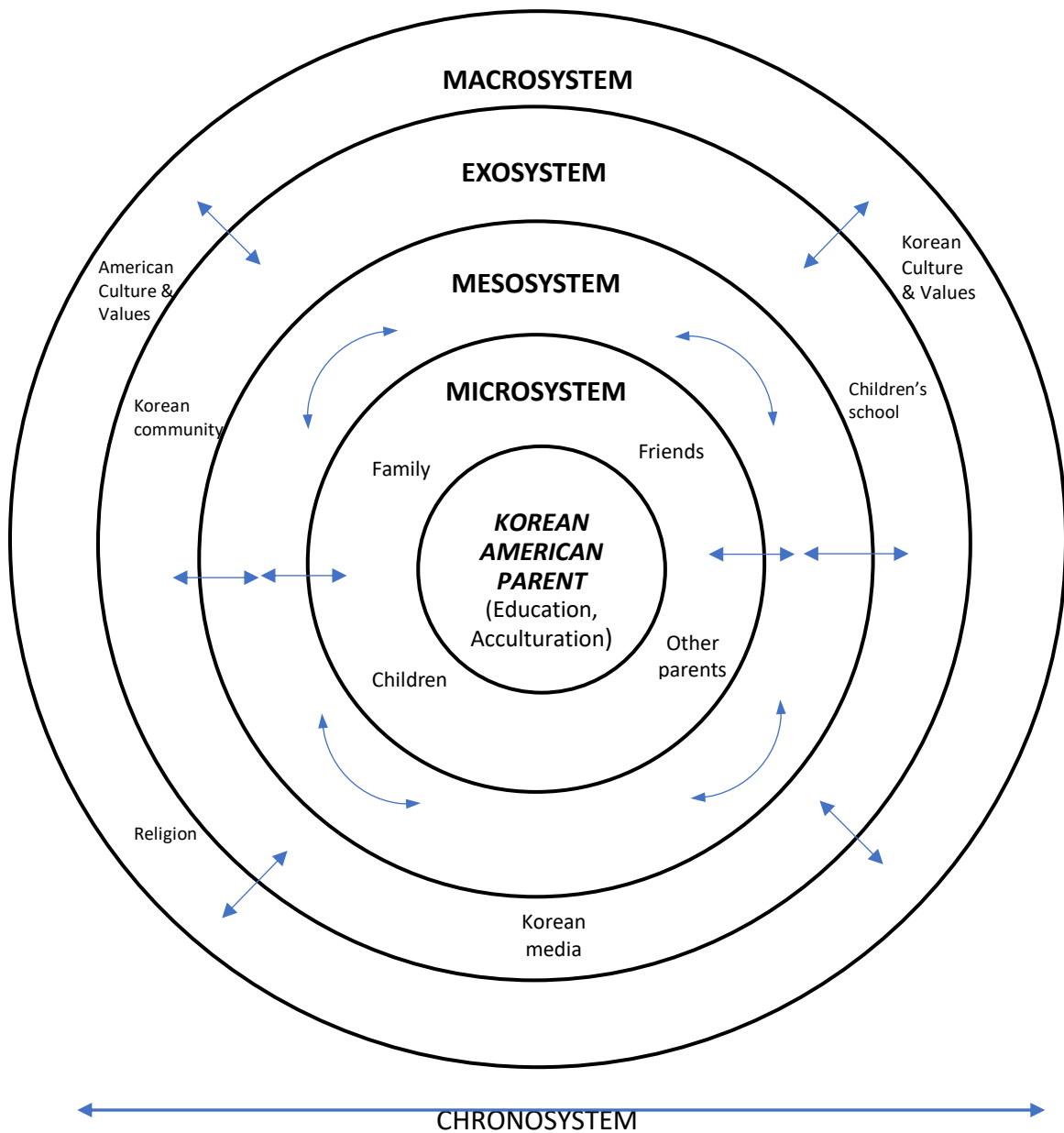


Figure 4. Multidimensional environment and the interrelations of Korean American parents

transition, which was migration, their perspectives on children's mathematics education expanded and diverged through diverse experiences, attributes that affected intrinsic values, and the developmental processes of acculturation throughout the life-course. The conceptualization of the nested system and the complex and multidimensional reciprocal interrelationship between parents and their children were emphasized in this study about mathematical learning and achievement. Intergenerational relations are an imperative means of transmitting parents' intrinsic values (Elder & Shanahan, 2007), and the findings of this study were consistent with the demonstration of the generational effect that distinctive ecological conditions contribute to the developmental processes of acculturation for immigrant parents, who in turn influence their children's developmental experiences through their expectations of mathematical achievement as well as the relationship of family. This study extended the convergence of the theoretical conceptions of the ecological system and the life-span of human development. Implications for the development of cultural identity among Korean American immigrant parents were also derived from the theoretical models. Results related to the research questions are as follows:

1. *What cultural beliefs or practices of Korean American parents contribute to their children's mathematical learning?*

First, the results in this study were consistent with previous literature on Asian Indian and Chinese parents (Farver et al., 2007), who maintained traditional forms of parenting until they were put in situations that challenged their beliefs on parenting. This study found that parental involvement in mathematics education was constructed based on their experiences and educational values, but this cultural model was being reconstructed. Korean American parents were more open to changes and negotiations as they lived longer in the United States. The sociocultural composites of mathematical values and practices of Korean American parents at

home were reflective of their own experiences and the socio-mathematical norms in Korean society. The parents not only maintained a cultural model of advancing their children to the next higher level of mathematics, but also shared the cultural model with them by practicing *sun hang hak seub* at home while still supporting the school cultural model of critical thinking and reasoning skills in mathematics.

Second, the findings in this study corresponded to Farver et al.'s (2007) results that parenting belief and the traditional practice of training are retained even after the parents' immigration. Korean American parents, who moved to the United States after graduating from college in Korea and lived in the United States for more than 10 years, emphasized that repetition and practice were imperative in arithmetical skills, such as memorizing the multiplication tables. This study also found that parental support in mathematics learning was provided at home before their children started attending school. Similar to Kao's (1995) and Schneider and Lee's (1990) findings, Korean American parents used their own resources to enrich their children's mathematics education by assigning supplementary mathematics practice problems and investing in private tutoring. Such results indicated that the Korean sociocultural belief and the parents' experience in mathematics practice when they were students were retained and passed on to their children at home.

Overall, Korean American parents who had more schooling in Korea considered the core subjects of the school curriculum, like mathematics, more seriously than those who had schooling in the United States. Regardless of acculturation style, the general sample of parents believed that Koreans' competitiveness and high emphasis on mathematics education would not dissipate completely over the generations, even after immigrating to another country.

2. *How are immigration experiences associated with Korean American parental involvement in their children's mathematical learning and achievement?*

First, this study's results supported Farver et al.'s (2007) findings on the development of parenting values among Asian American parents. Korean American parents' values and beliefs of childrearing were not completely replaced by those of the dominant culture, but rather were in the process of being adjusted and developed so that new sets of beliefs and practices were formed to facilitate the best of both cultures. Farver and Lee-Shin (2000) reported that parenting styles were similar between Korean American mothers with assimilated or integrated acculturation styles and European American families. Of those Korean American parents with both separated and integrated acculturation styles, this study found that the parenting styles resembles traditional Korean families in that they put a greater emphasis on mathematics education than did the parents with an integrated acculturation style.

Second, there was a consistent pattern with previous literature, particularly Civil et al.'s (2012) study, which demonstrated the issues that immigrant parents in Barcelona, Spain, and Tucson, Arizona, faced in their children's mathematics education. Korean American parents expressed pressure and challenges in being responsible for their children's mathematical achievement but managed to provide assistance with previously gained mathematical knowledge from when they were students themselves in Korea. Their frame of reference with respect to their children's mathematics learning was largely on other Korean American or Asian American families in the United States. Unlike Baolian Qin's (2006) "parallel dual frames of reference," Korean immigrant parents compared their children's mathematical performance to those of other children in the United States, but not in Korea.

Third, while Pong, Hao, and Gardner's (2005) study demonstrated that Asian immigrant parents of third-generation adolescents were more lenient than those of second-generation adolescents, the findings of this study revealed that more acculturated Korean immigrant parents were also more lenient. In addition, while Kao (2004) and Pong et al. (2005) reported a downward pattern in academic performance and academic advantage between the second and third generations of Asian students, a similar conclusion was drawn in this study that parental expectations of mathematics achievement and academic success declined as they became more acculturated.

Lastly, parental influence tended to be more assertive for home mathematics if they had schooling in Korea, and their children's mathematical knowledge seemed to be socially constructed in a combination of school mathematics practice with the influence of the parents' mathematical experience. However, the parents who finished their undergraduate studies in Korea explained that mathematics was the only subject with which they were familiar and were able to help (mostly) up to algebra. This particular group of parents tended to retain their experiences with mathematics education in Korea and associated those mathematics practices with their children's school mathematics. Further, they experienced more difficulties, cultural conflicts, and resistance from their American-born children due to differences in comprehending how to solve mathematics problems, language barriers, and gaps in cultural understandings.

Korean American parents viewed that effort and practice surpass innate ability in the process of developing mathematical knowledge. However, there were differences in ways of obtaining educational resources, types of challenges, and degree of participation in their children's mathematics education. When obtaining educational resources in mathematics, parents at acculturation level 2 associated with Asians and Korean Americans almost exclusively and

referred to Korean resources such as Korean newspapers, *hagwon* information sessions, and acquaintances from Korean church. They stated that these resources were used to develop mathematics skills which would help their children get ahead in school mathematics. The less acculturated group of parents reported scarce communication with mathematics teachers, primarily due to their lack of proficiency in English or lack of needs, unless their children underperformed.

3. *To what factors do Korean Americans attribute their parenting and educational expectations in mathematics achievement?*

This study's results were mostly consistent with the immigrant optimism hypothesis (Kao & Tienda, 1995), demonstrating that Korean American parents had aspirations for postsecondary education with a stable income for upward social mobility. However, more acculturated Korean American parents, especially the ones who obtained the highest education in the United States, tended to contribute less in higher education achievement for upward social mobility. Further, according to previous literature, parental aspirations for higher education were not based only on immigrant optimism, but also on immigrant pessimism which resulted from perceived discrimination. The findings of this study reinforced the results reported by Louie (2001) of immigrant pessimism in Korean immigrant parents' aspirations for mathematics education. As minorities in the United States, Korean American parents showed concerns for their children. They believed that superior performance in mathematics would make their children more prominent and less discriminated against. However, the longer they lived in the United States, the level of this belief declined as well. Korean American parents believed that mathematical achievement may provide more opportunities for choosing careers. Also, they had their children focus more on mathematics because they desired them to work in STEM fields and, hence, earn a

stable income. These immigrant parents continued to construe the importance of mathematics learning and achievement with about the same, if not lower, expectations than their parents did. Also, parents who graduated from college in Korea strongly held a cultural model that emphasized theoretical knowledge in mathematics studies and examination-oriented mathematics education. The main cause of this pattern was the ethnic minority status of Koreans in culturally diverse settings; moreover, they were concerned about their children being mistreated or not accepted by the dominant society if they were not successful.

Even though Korean American parents had difficulties and disadvantages, unlike Chinese and other immigrant families described in Gibbs et al.'s (2017) research, they did not consider these as temporary or as sacrifices that their children would have to validate or "pay off" with academic success. The significant difference in this study's conclusion was that Korean-born parents also developed a Western parenting style which focused on children's individuality.

While Korean American parents had different transition processes within social structures, they did not highly regard the stereotype labeling "Tiger Mother," yet they were not opposed to the idea of "Tiger Mother" either because they believed that parental pressure, discipline, and rote repetition were necessary, to some extent.

The results of this study were mostly consistent with Lee and Zhou's (2014) research demonstrating that immigrant parents conveyed education as the easiest way to be upwardly mobile and this was largely due to potential discrimination and the possibility of bias from the dominant society. Chinese and Vietnamese immigrant parents in Lee and Zhou's study and Korean immigrant parents in this study all believed that professions with advanced degrees would shield their children from such discrimination and bias. The results of this study reinforced the idea that assertiveness about education and success-focused childrearing practice

contributed to the image of “Tiger Mother” as a norm among immigrant parents. The Asian “Tiger Mother” is not ethnicity- or culture-specific; rather, it is an intergenerational product of immigrants from an academic success frame.

The majority of parents who participated in the survey (40 out of 44) and interviews (9 out of 10) were women. Of those women, more than half were stay-at-home mothers, which was consistent with Cohn et al.’s (2014) report. This sample reflected that in Korean families, females were more likely to participate in the survey and the interviews while taking a more active role in their children’s mathematics education.

The only male participant shared more often how his wife was actively involved in their children’s mathematics education than he was. All of the female interviewees revealed their active involvement in teaching mathematics at home, searching for mathematics educational resources, interacting with other Korean American mothers, or observing other Korean American mothers’ involvement. When the participants were asked about their parents’ expectations, more participants specifically pointed out their own mothers’ involvement, while only one participant mentioned her father, whether they were classified as being separated or integrated. Two participants briefly mentioned that their husbands were part of decision-making processes about their children’s educational attainment, and only one participant’s husband was actively involved in teaching mathematics at home to their children.

Implications

The main implications of this study for minority immigrant parents and mathematics educators were as follows. First, parenting cognition in mathematics education was modified as the participants in this study became acculturated to the dominant society. Korean American parents focused more on mathematics than on other subjects because of their experience in

Korea, where mathematical achievement was highly regarded. Hence, they contributed to their children's mathematics studies from an early age because it was beneficial for second-generation children to have early exposure to mathematics. These children's mathematical learning had an indirect impact from the Korean mathematics education system because of their immigrant parents, even though the children were never educated in Korea. Meanwhile, even though the parents struggled through the developmental process in an unfamiliar environment and were unable to help their children in higher-level mathematics because of its increasing complexity, they continued to provide support in mathematics through private supplemental education or to promote the importance of mathematics education. It is important to recognize children's difficulties at the hurdle of higher-level mathematics and how parents can encourage and rationally "push" their children without causing them to give up altogether, as this recognition can help children aspire and extend their studies in mathematics.

Second, most of the parents acknowledged the value of private academies in mathematics before starting the school year. The most common reasons were the belief that mathematics was not derived from other subjects but rather was the root of other subjects, and it offered opportunities for advancement. Offering opportunities such as summer school for minorities who do not have access to private supplemental education like *hagwon* can prevent students from falling behind during the school year. In addition, providing more detailed information on school systems in the native languages of immigrant minority parents can potentially enhance their own knowledge, which in turn can improve parental participation in children's mathematics studies. Such useful information can also help parents experience the developmental process more easily in the dominant society.

Third, less acculturated Korean immigrant parents in this study disclosed more of “Tiger Mother”-like practices in mathematics to protect their children from racial prejudice. Teacher education programs can address this mathematics practice at home, and construct and support a methodological approach that recognizes different values of parenting strategies in mathematics. This understanding can help to establish a learning environment where a more profound sense of a sociocultural outline of acculturation processes is achieved.

Limitations

The study had a few limitations. First, the sample size ($n = 44$) and the subsample size ($n = 10$) were relatively small. The study used a criterion-based and homogeneity sampling strategy to identify participants who met the essential predetermined criteria because the intention was to gain insight into the phenomenon of “Tiger Mother” among Korean American parents. The study focused on having parents share their immigration experience and changes in their parenting cognition of mathematics education in order to compare the original and dominant cultures from the immigrant parents’ perspectives as they were being acculturated. This rationale resulted in collecting responses only from 1.5- or second-generation Korean Americans who already had considerable exposure to both cultures. Instead of limiting the sample with experiences in both cultures, inviting all parents of Korean descent with exposure to either the American or Korean culture could have produced a larger sample size.

The findings in this study seem to be significant as they provide insights into how Korean American parents perceived mathematics education and the attributes that affected their expectations in mathematical achievement. However, the sample of this study was not representative of all Korean immigrants in the United States, a general conclusion cannot be made on the attributes that affected parents’ perspectives on mathematics learning and

achievement by acculturation process. First, by increasing the sample size of the study, the results could be more generalized and different attributes could be learned from the qualitative semi-structured interview. Second, more detailed demographic information of the participants such as age, income, and immigration status might help associating the findings of this study with similar studies of other immigrant parents. Third, the general sample in this study was not randomly selected. The general sample was taken through methods which suggest that these Korean American parents might be more attentive and dedicated to their children's mathematics studies than a mainstream Korean Americans. Further, the participants in this qualitative study resided in the United States more than 10 years and lived in the East Coast when the interviews were conducted. More specifically, insufficient participation of low-income Korean immigrant parents limited opportunities to explore the impact of social class on parenting cognition in mathematics education. By using a random sample of Korean parents in the United States, a more enhanced understanding of immigrant parents' childrearing cognition and a more robust analysis could be obtained. With a larger sample, the study may have produced more generalizable conclusions about parents of Korean descent in the United States and be representative of a larger population of Korean parents in the United States with different marital status, educational levels, gender, and socioeconomic status, and gained a deeper understanding of the complex and multidimensional reciprocal interrelationship between Korean American parents and their children throughout the acculturation processes. Though this study presents a profound comprehension on one sector of the population, more information would be valuable in understanding immigrant parents in the United States.

As a direct result of previously mentioned shortcomings, another limitation was that the findings of this study might relate to only a group of immigrant parents classified as being

separated or integrated, and not assimilated. A purposeful sampling selection procedure was used to uncover similarities in the immigration experience as well as concerns and associations between acculturation levels and mathematics education, while also explicating each parent's perspectives. However, more extensive methods of recruiting Korean immigrant parents could have obtained a greater range of responses from different levels of acculturation groups. Similarly, the study was limited geographically in that the findings were relevant to those who were immigrants living in the United States. With the increase of Korean migration to the United States for better educational opportunities for their children, more mathematics educational resources would be available that would provide a different acculturation process for Korean parents who are moving to another country and have fewer resources; this, then, would affect their overall parenting experience.

The participants were explicitly chosen because all their children took mathematics courses and they were asked only about mathematics studies and not other possible subjects that their children were also studying. Because East Asian parents encourage their children more frequently to pursue careers that are medical- or technology-related (Schneider & Lee, 1990), this research was designed to explore Korean American parents' perspectives on mathematics education, with the presumption that they participate more in children's mathematics studies than in other subjects. To a degree, this limited the type of responses from these parents because of the stress on mathematics. Inviting participants whose children did not take mathematics by choice at the high school level could be helpful in finding out how mathematics studies could benefit their children from different vantage points.

The findings of this study were mainly relevant to Korean American mothers. The higher rate of female participants was expected in this study as Asian immigrant mothers were more

likely to be stay-at-home mothers (Cohn et al., 2014). However, the recruitment of more Korean American fathers could have established more generalized answers to the research questions. Also, an online survey instrument was developed to be completed quickly and straightforwardly so that the quantitative data could capture the self-identity of acculturation but not parental involvement in mathematics education. Future studies should consider more in-depth questions about parents' opinions of mathematics studies and the details of their involvement in their children's mathematics education.

Finally, for interviews conducted in Korean, the translation and interpretation might have presented minor changes in the original statements because of differences in cultural nuance. A dual translation, from oral to written and from one language to another, may have created some limitations (Behar, 2003).

Recommendations

The findings and limitations of this study offer further research interests. First, future studies of this kind should attempt to investigate how American-born children comprehend mathematics and how their mathematical achievement are affected by Korean-born parents' cultural values of mathematics studies while the parents' development is in progress. The children's perspectives may help educators provide a support system for immigrant parents in constructing child development at home.

Based on the results of this study, further research questions could be developed. This study examined only parents with middle school or high school children. Are there any significant differences for parents with children in elementary schools or colleges? Further, future research should explore the complexities of recent Korean immigrants' parenting during the early acculturation stage, along with their socioeconomic status as well as "ethnic capital"

and “ethnic resources” (Lee & Zhou, 2014). Investigating the parents’ transition process over a period of time—from the initial stage of immigration to the later stages—could be helpful in better understanding the influence of the chronosystem on a developing person, and how parenting cognition evolves in mathematics education.

A research study on parents who are of Korean descent but also second- and third-generation or half-Koreans in America could be developed. Comparisons between how cultural values of mathematics education have dissipated within the groups and how interrelationships between generations of immigrants impact parenting strategies could be investigated

Finally, this study can be generalized by (a) investigating how Korean American parents’ perspectives remain the same or change for STEM-related subjects, such as science, computer science, or engineering; (b) examining other immigrant minority parents and their development and perspectives of mathematics education in the dominant country; (c) examining Korean immigrant parents in other countries to investigate how their development and parenting cognition differ from Korean American parents with regard to mathematics education.

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Appendix A

Survey Questionnaire in English

Demographic Information

1. Gender
 - a. Female
 - B. Male
2. Marital Status
 - a. Married
 - b. Divorced
 - c. Single
 - d. Domestic partner
 - e. Widowed
 - f. Prefer not to answer
3. What is the highest level of education that you completed?
 - a. High school or equivalent
 - b. Some college
 - c. Bachelor's Degree (Major: _____)
 - d. Master's Degree (Major: _____)
 - e. Doctoral Degree (Major: _____)
4. I completed my highest education in:
 - a. the United States
 - b. Korea
 - c. Other: _____
5. How long have you been in the United States?
 - a. 1 – 3 years
 - b. 4 – 6 years
 - c. 7 – 9 years
 - d. 10 years or more
6. Have you ever lived in other countries besides Korea and the United States?
 - a. No
 - b. Yes: _____
7. How long have your child been in the United States?
 - a. 1 – 3 years
 - b. 4 – 6 years
 - c. 7 – 9 years
 - d. 10 years or more
8. How many children do you have in total?
_____ boys _____ girls
9. What mathematics classes has your child been taken in high school?
10. Which of the following best describe your current employment status?

- a. Homemaker b. Student c. Employed d. Unemployed
- e. Retired

If employed, which field do you work in?

- a. Medical b. Education c. Finance d. Technology
- e. Science f. Arts g. Other: _____

Part I: Self Identity Acculturation Scale

Direction: Please circle one answer that best describe you.

1. What language can you speak?
 - a. Korean only
 - b. Mostly Korean, some English
 - c. Korean and English about equally well
 - d. Mostly English, some Korean
 - e. Only English
2. What language do you prefer?
 - a. Korean only
 - b. Mostly Korean, some English
 - c. Korean and English about equally well
 - d. Mostly English, some Korean
 - e. Only English
3. How do you identify yourself?
 - a. Oriental
 - b. Asian
 - c. Asian-American
 - d. Korean-American
 - e. American
4. What identification does (did) your mother use?
 - a. Oriental
 - b. Asian
 - c. Asian-American
 - d. Korean-American
 - e. American
5. What identification does (did) your father use?
 - a. Oriental
 - b. Asian
 - c. Asian-American
 - d. Korean-American
 - e. American

6. What was the ethnic origin of the friends and peers you had, as a child up to age 6?
 - a. Almost exclusively Asians, Korean-Americans
 - b. Mostly Asians, Korean -Americans
 - c. About equally Asian groups and Anglo groups
 - d. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
 - e. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
7. What was the ethnic origin of the friends and peers you had, as a child from 6 to 18?
 - a. Almost exclusively Asians, Korean-Americans
 - b. Mostly Asians, Korean -Americans
 - c. About equally Asian groups and Anglo groups
 - d. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
 - e. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
8. Whom do you now associate with in the community?
 - a. Almost exclusively Asians, Korean-Americans
 - b. Mostly Asians, Korean-Americans
 - c. About equally Asian groups and Anglo groups
 - d. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
 - e. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
9. If you could pick, whom would you prefer to associate with in the community?
 - a. Almost exclusively Asians, Korean-Americans
 - b. Mostly Asians, Korean-Americans
 - c. About equally Asian groups and Anglo groups
 - d. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
 - e. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
10. What is your music preference?
 - a. Only Korean music
 - b. Mostly Korean
 - c. Equally Korean and English
 - d. Mostly English
 - e. English only
11. What is your movie preference?
 - a. Korean movies only
 - b. Mostly Korean movies
 - c. Equally Korean and English movies
 - d. Mostly English movies
 - e. English movies only

12. What generation are you? (Circle the generation that best applies to you)
- a. 1st Generation = I was born in Korea or country other than U.S.
 - b. 2nd Generation = I was born in U.S., either parent was born in Korea or country other than U.S.
 - c. 3rd Generation = I was born in U.S., both parents were born in U.S., and all grandparents born in Korea or other country other than U.S.
 - d. 4th Generation = I was born in U.S., both parents were born in U.S., and at least one grandparents born in Korea or country other than U.S. and one grandparent born in U.S.
 - e. 5th Generation = I was born in U.S., both parents were born in U.S., and all grandparents also born in U.S.
 - f. Don't know what generation best fits since I lack some information
13. Where were you raised?
- a. In Korea only
 - b. Mostly in Korea, some in U.S.
 - c. Equally in Korea and U.S.
 - d. Mostly in U.S., some in Korea
 - e. In U.S. only
14. What contact have you had with Korea?
- a. Raised one year or more in Korea
 - b. Lived for less than one year in Korea
 - c. Occasional visits to Korea
 - d. Occasional communications (phone calls, Skype, etc.) with people in Korea
 - e. No exposure or communications with people in Korea
15. What is your food preference at home?
- a. Exclusively Korean food
 - b. Mostly Korean food, some American
 - c. About equally Korean and American
 - d. Mostly American food
 - e. Exclusively American food
16. What is your food preference in restaurants?
- a. Exclusively Korean food
 - b. Mostly Korean food, some American
 - c. About equally Korean and American
 - d. Mostly American food
 - e. Exclusively American food

17. Do you
- Read only Korean
 - Read Korean better than English
 - Read both Korean and English equally well
 - Read English better than Korean
 - Read only English
18. Do you
- Write only Korean
 - Write Korean better than English
 - Write both Korean and English equally well
 - Write English better than Korean
 - Write only English
19. If you consider yourself a member of the Korean group, how much pride do you have in this group?
- Extremely proud
 - Moderately proud
 - Little pride
 - No pride but do not feel negative toward group
 - No pride but do feel negative toward group
20. How would you rate yourself?
- Very Korean
 - Mostly Korean
 - Bicultural
 - Mostly Westernized
 - Very Westernized
21. Do you participate in Korean occasions, holidays, traditions, etc.?
- Nearly all
 - Most of them
 - Some of them
 - A few of them
 - None at all
22. Rate yourself on how well you fit when with other Koreans (Use the scale below, where 1 indicates that you do not fit and 5 indicates that you fit very well)
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
23. Rate yourself on how well you fit when with other Americans who are non-Koreans (Use the scale below, where 1 indicates that you do not fit and 5 indicates that you fit very well)
- | | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

24. There are many different ways in which people think of themselves. Which ONE of the following most closely describes how you view yourself?
- a. I consider myself basically Korean. Even though I live and work in America, I still view myself basically as a Korean.
 - b. I consider myself basically as an American. Even though I have a Korean background and characteristics, I still view myself basically as an American.
 - c. I consider myself as a Korean-American, although deep down I always know I am a Korean.
 - d. I consider myself as a Korean-American, although deep down, I view myself as an American first.
 - e. I consider myself as a Korean-American. I have both Korean and American characteristics, and I view myself as a blend of both.

Part II: Parent involvement in children's mathematics education

Direction: Please circle one answer that best describe you.

1. What language do you use when communicating with your child?
 - a. Korean only
 - b. Mostly Korean, some English
 - c. Korean and English about equally
 - d. Mostly English, some Korean
 - e. Only English
2. Whom do you now associate with in the community to obtain information regarding your child's mathematical education?
 - a. Almost exclusively Asians, Korean-Americans
 - b. Mostly Asians, Korean-Americans
 - c. About equally Asian groups and Anglo groups
 - d. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
 - e. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
3. If you could pick, whom would you prefer to associate with in the community to obtain information regarding your child's mathematical education?
 - a. Almost exclusively Asians, Korean-Americans
 - b. Mostly Asians, Korean-Americans
 - c. About equally Asian groups and Anglo groups
 - d. Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
 - e. Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
4. Which educational resources for mathematics do you refer to?
 - a. Exclusively Korean
 - b. Mostly Korean, some American
 - c. About equally Korean and American
 - d. Mostly American
 - e. Exclusively American

5. Rate yourself on how much you believe in Korean values about mathematics education (Use the scale below, where 1 indicates that you do not believe and 5 indicates that you strongly believe in Korean values).

1 2 3 4 5

6. Rate yourself on how much you believe in American (Western) values about mathematics education (Use the scale below, where 1 indicates that you do not believe and 5 indicates that you strongly believe in American values).

1 2 3 4 5

7. How much has your expectation changed concerning your child's mathematical achievement, compared to the expectation you had while in Korea? If you have not lived in Korea, skip to question 11 (Use the scale below, where 1 indicates lower expectation and 5 indicates higher expectation).

1 2 3 4 5

8. How much has your expectation changed concerning your child's mathematical achievement, compared to the expectation your parents had of you? (Use the scale below, where 1 indicates lower expectation and 5 indicates higher expectation).

1 2 3 4 5

Appendix B

Survey Questionnaire in Korean

Demographic Information

1. 본인 성별

- a. 여 b. 남

2. 결혼 여부

- a. 기혼 b. 이혼 c. 싱글 d. 동거
e. 미망인 f. 기타

3. 수료한 최고 수준의 교육

- a. 고등학교 또는 이와 동등한 레벨
b. 일부 대학
c. 학사 학위 (전공: _____)
d. 석사 학위 (전공: _____)
e. 박사 학위 (전공: _____)

4. 질문 3 에서 답하신 학위를 마친 곳을 체크해주세요:

- a. 미국
b. 한국
c. 기타: _____

5. 미국에 계신지는 얼마나 되셨나요?

- a. 1 – 3 년
b. 4 – 6 년
c. 7 – 9 년
d. 10 년 이상

6. 한국과 미국 이외의 다른 나라에서도 살아 보신 적이 있으신가요?

- a. 아니요 b. 네 (나라: _____)

7. 자녀분들은 미국에 얼마나 오래 있었나요?

- a. 1 – 3 년
- b. 4 – 6 년
- c. 7 – 9 년
- d. 10 년 이상

8. 총 몇명의 자녀분들이 있으세요?

남자 _____ 여자 _____

9. 자녀분이 고등학교에서 어떤 수학 수업들을 들었나요?

10. 다음 중 귀하의 현재 고용 현황을 가장 잘 설명한 것을 체크해 주세요.

- a. 가정주부
- b. 학생
- c. 직장인
- d. 실직자
- e. 은퇴자

지금 직장인 이시면 어떤 분야에서 일을 하세요?

- a. 의료
- b. 교육
- c. 금융
- d. 테크놀로지
- e. 과학
- f. 예술
- g. 기타: _____

Part I: Self Identity Acculturation

1. 다음 중 어떤 언어를 말할 수 있으세요 ?

- a. 한국어
- b. 대부분 한국어, 약간의 영어
- c. 한국어와 영어 둘다 똑같이 잘합니다
- d. 대부분 영어, 약간의 한국어
- e. 영어

2. 어떤 언어를 사용하시는 것을 선호하세요?
- a. 한국어
 - b. 대부분 한국어, 약간의 영어
 - c. 한국어와 영어 둘다 똑같이 잘합니다
 - d. 대부분 영어, 약간의 한국어
 - e. 영어
3. 다음 중 본인을 가장 잘 묘사 하는 답 하나를 골라주세요.
- a. 오리엔탈
 - b. 아시안
 - c. 아시안 아메리칸
 - d. 코리안 아메리칸
 - e. 아메리칸
4. 다음 중 본인의 어머니를 가장 잘 묘사 하는 답 하나를 골라주세요.
- a. 오리엔탈
 - b. 아시안
 - c. 아시안 아메리칸
 - d. 코리안 아메리칸
 - e. 아메리칸
5. 다음 중 본인의 아버지를 가장 잘 묘사 하는 답 하나를 골라주세요.
- a. 오리엔탈
 - b. 아시안
 - c. 아시안 아메리칸
 - d. 코리안 아메리칸
 - e. 아메리칸

6. 본인의 6 살때까지의 친구분들을 가장 잘 묘사하는 답 하나를 골라주세요.
- a. 모두 아시안, 코리안 아메리칸 그룹
 - b. 대부분 아시안, 코리안 아메리칸 그룹
 - c. 아시안과 백인 그룹
 - d. 대부분 백인, 흑인, 히스패닉, 비아시안 그룹
 - e. 모두 백인, 흑인, 히스패닉, 비아시안 그룹
7. 본인의 6 살부터 18 살 때까지의 친구분들을 가장 잘 묘사하는 답 하나를 골라주세요.
- a. 모두 아시안, 코리안 아메리칸 그룹
 - b. 대부분 아시안, 코리안 아메리칸 그룹
 - c. 아시안과 백인 그룹
 - d. 대부분 백인, 흑인, 히스패닉, 비아시안 그룹
 - e. 모두 백인, 흑인, 히스패닉, 비아시안 그룹
8. 현재 어느 커뮤니티와 주로 교제를 하세요?
- a. 모두 아시안, 코리안 아메리칸 그룹
 - b. 대부분 아시안, 코리안 아메리칸 그룹
 - c. 아시안과 백인 그룹
 - d. 대부분 백인, 흑인, 히스패닉, 비아시안 그룹
 - e. 모두 백인, 흑인, 히스패닉, 비아시안 그룹
9. 만약 선택하실 수 있다면, 어느 커뮤니티와 교제를 하시길 원하세요?
- a. 모두 아시안, 코리안 아메리칸 그룹
 - b. 대부분 아시안, 코리안 아메리칸 그룹
 - c. 아시안과 백인 그룹
 - d. 대부분 백인, 흑인, 히스패닉, 비아시안 그룹
 - e. 모두 백인, 흑인, 히스패닉, 비아시안 그룹

10. 어떤 음악을 주로 들으시나요?

- a. 오직 한국 음악
- b. 주로 한국 음악
- c. 동등하게 한국, 미국 음악
- d. 대부분 미국 음악
- e. 오직 미국 음악

11. 어떤 영화를 주로 보시나요?

- a. 오직 한국 영화
- b. 주로 한국 영화
- c. 동등하게 한국, 미국 영화
- d. 대부분 미국 영화
- e. 오직 미국 영화

12. 본인을 가장 잘 묘사하는 세대를 선택해 주세요.

- a. 이민 1 세대 = 저는 미국이 아닌 한국 또는 다른 나라에서 태어났습니다.
- b. 이민 2 세대 = 저는 미국에서 태어나고, 부모님 중 한 분은 미국이 아닌 한국 또는 다른 나라에서 태어나셨 습니다.
- c. 이민 3 세대 = 저는 미국에서 태어나고, 부모님 두분 모두 미국에서 태어나셨습니다. 조부모님 모두 미국이 아닌 한국 또는 다른 나라에서 태어나셨 습니다.
- d. 이민 4 세대 = 저는 미국에서 태어나고, 부모님 두분 모두 미국에서 태어나셨습니다. 적어도 한 분 이상의 조부모님이 모두 미국이 아닌 한국 또는 다른 나라에서 태어나셨고, 한 분은 미국에서 태어나셨 습니다.
- e. 이민 5 세대 = 저는 미국에서 태어나고, 모든 부모님, 조부모님 또한 미국에서 태어나셨 습니다.
- f. 정보가 부족하여 어떤 세대가 가장 적합한지 모르겠습니다.

13. 어디에서 자라셨습니까?
- a. 한국에서만 자랐습니다.
 - b. 대부분 한국, 일부분은 미국
 - c. 한국과 미국에서 동등하게 살았습니다.
 - d. 대부분 미국, 일부분은 한국
 - e. 미국에서만 자랐습니다.
14. 한국에는 얼마나 자주 방문 하세요? (가장 자주 일어나는 하나를 선택해 주세요.)
- a. 일년 이상 한국에서 살았습니다.
 - b. 한국에서 일년 미만 살았습니다.
 - c. 한국에 종종 방문 합니다.
 - d. 종종 한국에 있는 분들과 연락 (전화, Skype 등 화상채팅) 합니다.
 - e. 한국과 아무 연락이나 연고가 없습니다.
15. 집에서 주로 어떤 음식을 선호 하시나요?
- a. 오직 한국 음식
 - b. 주로 한국 음식, 가끔 미국 음식
 - c. 한국, 미국 음식 동등하게 선호
 - d. 주로 미국 음식
 - e. 오직 미국 음식
16. 외식을 하실 경우에는 주로 어떤 음식을 선호 하시나요?
- a. 오직 한국 음식
 - b. 주로 한국 음식, 가끔 미국 음식
 - c. 한국, 미국 음식 동등하게 선호
 - d. 주로 미국 음식
 - e. 오직 미국 음식

17. 해당 사항 하나를 선택해 주세요.

- a. 한국어만 읽습니다.
- b. 영어보다 한국어로 더 잘 읽습니다.
- c. 영어, 한국어 둘다 모두 잘 읽습니다.
- d. 한국어 보다 영어로 더 잘 읽습니다.
- e. 영어만 읽습니다.

18. 해당 사항 하나를 선택해 주세요 (글을 쓰는 경우입니다.)

- a. 한국어로만 쓸 수 있습니다.
- b. 영어보다 한국어로 더 잘 쓸 수 있습니다.
- c. 영어, 한국어 둘다 모두 잘 쓸 수 있습니다.
- d. 한국어 보다 영어로 더 잘 쓸 수 있습니다.
- e. 영어로만 쓸 수 있습니다.

19. 만약 한인 그룹의 일원으로 생각하신다면, 이 그룹에 얼마나 자부심이 있으세요?

- a. 매우 자랑스러움
- b. 적당한 자부심
- c. 약간의 자부심
- d. 자부심은 없지만, 그룹에 대해 부정적이지는 않음
- e. 자부심은 없지만, 그룹에 대해 부정적임

20. 다음 중에 본인이 어느 문향과 가장 가깝다고 생각하세요?

- a. 매우 한국인적임
- b. 거의 한국인적임
- c. 이중 문화적임
- d. 거의 서구화적임
- e. 매우 서구화적임

21. 한국 에 관련된 행사, 휴일, 전통 등에 참여하고 계세요?
- a. 모두 참여
 - b. 대부분 참여
 - c. 일부분만 참여
 - d. 아주 가끔 참여
 - e. 전혀 참여하지 않음
22. 다른 한국분들과 교제시 편안함에 대해 평가해 주세요. (아래 스케일을 사용해 주세요.)
- 1 아주 많이 불편함
 - 2 조금 불편함
 - 3 보통
 - 4 조금 편함
 - 5 아주 많이 편함
23. 한국분들이 아닌 다른 민족의 분들과 어울리 실때 얼마나 잘 맞으시는 지에 대해 스스로를 평가해 주세요. (아래 스케일을 사용해 주세요. 1 은 아주 잘 맞지 않고 5 는 아주 잘 맞음을 나타냅니다.)
- 1 아주 많이 불편함
 - 2 조금 불편함
 - 3 보통
 - 4 조금 편함
 - 5 아주 많이 편함
24. 사람들이 자신 스스로를 생각하는 방식은 다양합니다. 다음 중 귀하를 가장 잘 묘사하는 하나를 골라주세요. 저는 제 자신을 한국인 이라고 여깁니다. 비록 미국에서 살고있지만, 여전히 제 자신 스스로를 한국인으로 여깁니다.
- a. 저는 제 자신을 아메리칸으로 여깁니다. 비록 한국인 배경과 특징을 가지고 있지만, 제 자신을 미국인으로 생각합니다.

- b. 저는 제 자신을 코리안 아메리칸으로 여기지만, 제가 항상 한국인임을 기억하고 있습니다.
- c. 저는 제 자신을 코리안 아메리칸으로 생각하지만, 마음 깊은 곳에는 제 자신을 미국인으로 먼저 여기는 편입니다.
- d. 저는 제 자신을 코리안 아메리칸으로 여깁니다. 한국인과 미국인의 특징을 모두 가지고 있고, 제 자신을 두 문화의 조합으로 생각합니다.

Part II: Parent involvement in children's mathematics education

1. 자녀분과 대화를 하실 때 어떤 언어를 사용 하시나요?
 - a. 오직 한국어
 - b. 대부분 한국어, 약간의 영어
 - c. 한국어와 영어 동등하게 사용
 - d. 대부분 영어, 약간의 한국어
 - e. 오직 영어
2. 자녀분의 수학 교육에 관한 정보를 얻을 때 주로 어느 커뮤니티 분들과 교제 하세요?
 - a. 모두 아시아인, 코리안 아메리칸
 - b. 대부분 아시아인, 코리안 아메리칸
 - c. 아시아인 그룹과 백인 그룹 동등하게
 - d. 대부분 백인, 흑인, 히스패닉, 비아시아인
 - e. 모두 백인, 흑인, 히스패닉, 비아시아인
3. 만약 선택하실 수 있으시다면, 자녀분의 수학 교육에 관한 정보를 얻을 때 주로 어느 커뮤니티 분들과 교제 하시기를 원하세요?
 - a. 모두 아시아인, 코리안 아메리칸
 - b. 대부분 아시아인, 코리안 아메리칸
 - c. 아시아인 그룹과 백인 그룹 동등하게
 - d. 대부분 백인, 흑인, 히스패닉, 비아시아인
 - e. 모두 백인, 흑인, 히스패닉, 비아시아인

4. 주로 어떤 교육 자료를 참조하세요?

- a. 모두 한국어로만 된 자료
- b. 주로 한국어, 가끔 영어로 된 자료
- c. 한국어, 영어 자료 동등하게 사용
- d. 주로 영어로 된 자료
- e. 모두 영어로 된 자료

5. 수학 교육에 관련하여 한국적인 방식과 가치를 얼마나 믿고 따르시는지 평가해 주세요. (1 은 전혀 믿지 않음을 나타내고 5 는 아주 많이 믿음을 나타냅니다.)

1 2 3 4 5

6. 수학 교육에 관련하여 미국적인 방식과 가치를 얼마나 믿고 따르시는지 평가해 주세요. (1 은 전혀 믿지 않음을 나타내고 5 는 아주 많이 믿음을 나타냅니다.)

1 2 3 4 5

7. 한국에서 미국으로 오신 이후로, 자녀분의 수학 성취에 대한 기대가 얼마나 변하셨나요? 만약 한국에 사시지 않았다면, 11 번으로 스킵해 주세요. (아래 1 은 기대치가 많이 낮아짐을 나타내고, 5 는 기대치가 더 많이 늘었음을 나타냅니다.)

1 2 3 4 5

8. 자녀분의 수학 성취에 대한 기대가, 귀하의 부모님이 귀하에게 가지신 기대치와 비교했을때 얼마나 달라졌나요? (1 은 자녀분에 대한 기대가 더 낮음을 나타내고, 5 는 기대가 더 높음을 나타냅니다.)

1 2 3 4 5

Appendix C

Interview Template

1. Immigration Background

- 1.1 Why did you move to the U.S.? How long have you been in the U.S.?
- 1.2 Were your children born in the U.S.? Ages?
- 1.3 How is your experience as a Korean immigrant? As an immigrant parent?

2. Mathematics Perception

- 2.1 Did you enjoy mathematics as a student? Describe your experience.
Did your parents emphasize a lot on mathematics education? If so, how?
- 2.2 Does your Korean mathematics education experience affect your child's mathematics education? If so, how?
What kind of Korean cultural values do you think is stressed in mathematics education? (Example: Good grades, Advanced learning, mathematics contest, *sun hang hak seub, hagwon*)
- 2.3 What plays the most important role in students' mathematical capacity? (Example: parents' role, Innate abilities, gender, training)
How can someone be better in mathematics? Methods? What is the best way to study math?

3. Mathematics Home Practice

- 3.1 Have you ever tutored them in math?
What do Korean immigrant parents do to support their children's mathematics study at home?
Have you applied your educational knowledge to help your children's mathematics education? (Example: parent tutoring, books, siblings, extended family members)
Have your children ask for your help in mathematics?
- 3.2 Where do you obtain information about your child's mathematics education?
Whom do you talk to?
Supplemental mathematics books (Example: workbooks, textbooks)
Is it necessary to send your children to supplementary education programs? SAT *hagwon*?
- 3.3 Because of mathematics education, have you had any acculturation difficulties?
- 3.4 Describe how your Korean background experiences or cultural values help you with your child's mathematics education. Challenge?

Has your immigration experience influenced your children's academic experiences? (for example, my parents had a tough acculturation that they regret not getting information early enough for me)

4. Tiger Mother Characteristics

- 4.1 Why mathematical achievement more important than other subjects? Any pressure to do well?
- 4.2 Do you believe that mathematics provide more opportunities?
Would you enroll your children in higher math classes if possible?
- 4.3 What are your expectations for your child in mathematics? (Higher education, career)
Why do you think it is beneficial to learn mathematics content prior/in advance to the regular classes?
- 4.4 What are some challenges regarding your children's mathematics education?
- 4.5 Is academic success necessary? Why is it important?
What does "successful kids" mean to you?
- 4.6 Why is necessary for Korean parents still strict and stern in America?
- 4.7 Are you satisfied with your child's mathematics achievement? Why or why not?
- 4.8 What sacrifices have you done for your child? Do you think your child understand your sacrifice? Are you willing to give up anything for your children?
How important is school district or ranking? Does this affect where you want to live?
- 4.9 Compared to the mainstream American family, do you have any different approach in parenting?
- 4.10 In your opinion, does academic achievement reflect successful parenting and if children did not excel at school then parents are not doing their job?

5. Korea vs U.S.

- 5.1 What are some things Korean mathematics teaching stress differently from the U.S.? Learning? Are you satisfied with U.S. mathematics education system? Are there any differences between Korean and American mathematics teachers.
- 5.2 How do you feel about the quality of mathematics education in the U.S.? Quality of teaching mathematics?
- 5.3 What are some positive/negative aspects of the U.S. mathematics class (teacher pay attention to individual students, easy communication such as ask questions easily) compared to Korean?

In terms of class instruction, which is better? Korea or U.S.? (listen vs collaborate; individual or group work)

Do you think U.S. school meet your expectations in terms of mathematics education?
(needs met for gifted/accelerated students?) Learning enough mathematics content or
homework?

How important is it to pass on Korean traditions and identity to your children?

Appendix D

Post-Interview Questionnaire in English

Parental Perspectives on Mathematics Education

Direction: Please circle one answer that best describe your feelings for each statement using the response scale.

1 – Strongly Disagree 2 – Disagree 3 – Neutral 4 – Agree 5 – Strongly Agree

1. Mathematics is a very worthwhile and necessary subject.
2. Mathematics is the most important subject that everyone should study.
3. High school mathematics courses would be very helpful no matter what my child decides to major in.
4. I am usually not satisfied with my child's mathematics grades.
5. I expect my child to take as many mathematics courses as he/she can during his/her school years.
6. I will be very disappointed if my child does not make the top in mathematics class.
7. I believe studying mathematics helps my child with problem solving in other areas.
8. A strong mathematics background could help my child in his/her professional life.
9. I am enthusiastic about my child's mathematics education.
10. I am only pleased when my child gets A in mathematics class.
11. When my child needs help in mathematics, I hire a tutor.
12. I am more stern and assertive when it comes to my child's mathematical studies and achievement compared to other subjects.

Appendix E

Post-Interview Questionnaire in Korean

Direction: 각 문항에 대한 본인의 의견을 가장 잘 묘사하는 하나를 선택해 주세요.

1 – 전혀 동의하지 않음 2 – 동의하지 않음 3 – 중립 4 – 동의함 5 – 강력하게 동의함

1. 수학은 매우 가치 있고 필요한 과목입니다.
2. 수학은 모두가 꼭 공부해야 하는 아주 중요한 과목입니다.
3. 제 아이가 무엇을 전공하기로 결정하든, 고등 학교 수학 과정은 매우 도움이 될 것입니다.
4. 저는 제 아이의 수학 성적에 주로 만족하지 못합니다.
5. 저는 제 아이가 학교에 다니면서 가능한 최대한 많은 수학 과목을 듣기를 원합니다.
6. 제 아이가 만약 수학 클래스에서 상위권에 들지 못한다면 많이 속상할 것 같습니다.
7. 수학 공부를 하는 것이 다른 분야에서 문제 해결에 도움이 될 것이라고 믿습니다.
8. 강한 수학 백그라운드는 제 아이의 직업생활에 도움이 될 것입니다.
9. 저는 제 아이의 수학 교육에 열정적입니다.
10. 저는 제 아이가 수학 시험 A 를 맞았을 때만 기쁩니다.
11. 제 아이가 수학 공부에 도움이 필요하다면, 과외 선생님을 구할 것입니다.
12. 제 아이의 수학 공부와 점수에 관련된 일이라면 다른 과목보다 아이를 적극적으로 엄하게 가르치는 경향입니다.

Appendix F

Preliminary Survey Data Analysis

Number of Years Lived in the U.S.

Years	Parent		Children	
	n	%	n	%
1-3 years	2	4.5	2	4.5
4-6 years	1	2.3	1	2.3
7-9 years	2	4.5	4	9.1
10 years or more	39	88.6	37	84.1
Total	44	100.0	44	100.0

Responses to “How much has your expectation changed concerning your child’s mathematical achievement, compared to the expectation you had while in Korea?”

	n	%
Much lower	5	11.4
Slightly lower	3	6.8
About the same	4	9.1
Slightly higher	7	15.9
Much higher	7	15.9
Not Applicable	18	40.9
Total	44	100.0

Responses to “How much has your expectation changed concerning your child’s mathematical achievement, compared to the expectation your parents had of you?”

	n	%
Much lower	6	13.6
Slightly lower	5	11.4
About the same	17	38.6
Slightly higher	7	15.9
Much higher	8	18.2
Not Applicable	1	2.3
Total	44	100.0

Self-Identification of Participants and Their Parents

	Yourself		Mother		Father	
	n	%	n	%	n	%
Oriental	0	0	1	2.3	2	4.5
Asian	24	54.5	35	79.5	35	79.5
Asian-American	5	11.4	0	0.0	0	0.0
Korean American	13	29.5	8	18.2	7	15.9
American	2	4.5	0	0.0	0	0.0
Total	44	100.0	44	100.0	44	100.0

Responses to “What was the ethnic origin of the friends and peers you had, as a child up to age 6?” and “from 6 to 18”

	Up to age 6		6 to 18	
	n	%	n	%
Almost exclusively Asians, Korean Americans	35	79.5	29	65.9
Mostly Asians, Korean Americans	5	11.4	8	18.2
About equally Asian groups and Anglo groups	1	2.3	4	9.1
Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups	1	2.3	3	6.8
Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups	2	4.5	0	0.0
Total	44	100.0	44	100.0

Responses to Music and Movie Preference

	Music		Movie	
	n	%	n	%
Only Korean music	0	0.0	3	6.8
Mostly Korean	19	43.2	9	20.5
Equally Korean and English	13	29.5	24	54.5
Mostly English	9	20.5	5	11.4
English only	3	6.8	3	6.8
Total	44	100.0	44	100.0

Responses to Preferred food at Home and at Restaurants

	Home		Restaurant	
	n	%	n	%
Exclusively Korean food	3	6.8	1	2.3
Mostly Korean food, some American	22	50.0	15	34.1
About equally Korean and American	18	40.9	20	45.5
Mostly American food	1	2.3	8	18.2
Exclusively American food	0	0	0	0
Total	44	100	44	100

Responses to Locations where participants were raised and Contact they have with Korea

Raised	n	%	Contact in Korea	n	%
In Korean only	27	61.4	Raised one year or more in Korea	9	20.5
Mostly in Korea, some in U.S.	10	22.7	Lived for less than one year in Korea	1	2.3
Equally in Korea and U.S.	2	4.5	Occasional visits to Korea	15	34.1
Mostly in U.S., some in Korea	2	4.5	Occasional communications (phone calls, Skype, etc.) with people in Korea	15	34.1
In U.S. only	3	6.8	No exposure or communications with people in Korea	4	9.1
Total	44	100.0		44	100.0

Responses to Self-Identify Generation

	n	%
1 st generation	40	90.9
2 nd generation	2	4.5
3 rd generation	0	0.0
4 th generation	1	2.3
5 th generation	0	0.0
Do not know	1	2.3
Total	44	100.0

Responses to how much pride they have in Korean Group

Pride in Korean group	n	%
Extremely proud	5	11.4
Moderately proud	23	52.3
Little pride	7	15.9
No pride but do not feel negative toward group	8	18.2
No pride but do feel negative toward group	1	2.3
Total	44	100.0

Responses to Self-Rating and Participation in Korean holidays, traditions

Rate yourself	n	%	Participation	n	%
Very Korean	9	20.5	Nearly all	1	2.3
Mostly Korean	19	43.2	Most of them	10	22.7
Bicultural	14	31.8	Some of them	17	38.6
Mostly Westernized	2	4.5	A few of them	15	34.1
Very Westernized	0	0.0	None at all	1	2.3
Total	44	100.0	Total	44	100.0

Response to “How well you fit when with other Koreans” and “How well you fit when with other Americans who are non-Koreans” (24, 25)

	Koreans		Americans (non-Koreans)	
	n	%	n	%
Not well at all	0	0.0	2	4.5
Slightly well	3	6.8	13	29.5
Moderately well	22	50.0	22	50.0
Very well	16	36.4	7	15.9
Extremely well	3	6.8	0	0.0
Total	44	100.0	44	100.0

Appendix G

Interviewees' Answers to Post-Interview Questionnaire

	Questions											
	1	2	3	4	5	6	7	8	9	10	11	12
Andy (2)	5	5	4	3	3	2	3	2	4	1	4	4
Blair (2)	5	5	5	3	4	2	5	3	4	1	4	3
Chloe (3)	4	4	3	5	4	4	3	3	4	4	3	4
Diana (2)	5	5	5	4	5	5	5	5	5	4	5	5
Ellen (2)	3	4	4	4	2	4	4	3	2	4	4	4
Felicia (2)	5	4	5	2	5	5	5	5	3	2	3	4
Gloria (3)	4	2	2	1	2	2	4	2	3	2	2	2
Hazel (3)	5	4	4	2	4	4	4	4	4	4	4	2
Irene (3)	5	5	5	2	5	4	5	5	4	2	4	4
Jackie (3)	5	2	3	2	2	1	4	4	4	1	3	2
Mean	4.6	4.0	4.0	2.8	3.6	3.3	4.2	3.6	3.7	2.5	3.6	3.4

Appendix H

Interview Categories for Coding

Category	Code
Immigration	Immigration Experience
	Unfamiliarity in School System
	Language Barrier
	Cultural Differences
Attitudes toward Mathematics	Parents' Experience
	Participants' Parents
Korean Cultural Beliefs on Mathematics	Repetition and Practice
	Memorization
	<i>Kukudan</i>
	High Educational Values
Practice on Mathematics	<i>Sun Hang Hak Seub</i>
	Hagwon
	Skip Grade Levels
	Tutor
Parental Support at Home	Challenges
	Second generation children
	Sources of Mathematics Education
Association	Korean Community
Comparison in Mathematics Education Systems	American Mathematics Education
	Korean Mathematics Education
	International Studies
	TIMSS
	Common Core Standards
	Houghton Mifflin Standards
	Math in Focus
	Singapore Math
	Textbooks
	Mathematics Teachers
Tiger Mother	Reasons Behind High Interest in Mathematics
	STEM
	Capabilities of Children and Mothers
	Asian Mothers
	Opportunities
	Discrimination
	Expectations
Interest in Other Ethnicities	Chinese
	Indian

Appendix I

Interviewees' Answers to Post-Interview Questionnaire

ID			ID			ID			ID			ID		
1	2.38	M	11	1.62	B	21	2.00	B	31	2.67	M	41	2.29	B
2	3.33	M	12	3.71	B	22	2.10	M	32	2.62	D	42	2.33	B
3	2.81	B	13	1.95	S	23	1.76	B	33	2.10	B	42	2.05	B
4	2.52	D	14	2.43	B	24	3.33	B	34	2.05	M	44	2.00	B
5	2.05	B	15	2.00	S	25	2.38	B	35	2.95	M			
6	1.52	H	16	2.10	B	26	1.81	B	36	2.05	M			
7	2.33	B	17	2.38	B	27	2.62	M	37	3.48	B			
8	2.48	M	18	2.24	B	28	2.05	B	38	1.62	H			
9	1.95	M	19	2.33	B	29	2.71	B	39	2.10	S			
10	2.29	D	20	3.05	B	30	2.00	H	40	2.00	B			

H – High School or Equivalent

S – Some College

B – Bachelor's Degree

M – Master's Degree

D – Doctoral Degree

High School or Equivalent (3 people)

ID	Acculturation	
6	1.52	
30	2.00	
38	1.62	
Mean		1.71

Some College (3 people)

ID	Acculturation	
13	1.95	
15	2.00	
39	2.10	
Mean		2.02

Bachelor's Degree (25 people)

ID	Acculturation
3	2.81
5	2.05
7	2.33
11	1.62
12	3.71
14	2.43
16	2.10
17	2.38
18	2.24
19	2.33
20	3.05
21	2.00
23	1.76
24	3.33
25	2.38
26	1.81
28	2.05
29	2.71
33	2.10
37	3.48
40	2.00
41	2.29
42	2.33
42	2.05
44	2.00
Mean	2.37

Master's Degree (10 people)

ID	
1	2.38
2	3.33
8	2.48
9	1.95
22	2.10
27	2.62
31	2.67
34	2.05
35	2.95
36	2.05
Mean	2.46

Doctoral Degree (3 people)

ID	Acculturation	
4	2.52	
10	2.29	
32	2.62	
Mean		2.48